CALIFORNIA STATE UNIVERSITY, FRESNO

THE CALIFORNIA STATE UNIVERSITY AND COLLEGES

GENERAL CATALOG

1972/1973

ON JUNE 1, 1972, FRESNO STATE COLLEGE OFFICIALLY BECAME THE CALIFORNIA STATE UNIVERSITY, FRESNO

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ACADEMIC CALENDAR

JUNE 1972

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ACADEMIC CALENDAR 1972–1973

(Calendar dates subject to change)

Summer Session, 1972 ..... June 19–July 28, inclusive
Post Session, 1972 ..... July 31–September 1, inclusive

	Fall Semester 1972	*Spring Semester 1973*
Semester begins	Sept 11, M	Jan 30, T
Academic Assembly meets	Sept 11, M	
All new undergraduate students meet	Sept 11, M	Jan 30, T
Orientation, advising, registration (See *Schedule of Courses*)	Sept 12–15, T–F	Jan 30–Feb 2, T–F
Instruction begins	Sept 18, M	Feb 5, M
Late registration begins ($5 fine)	Sept 18, M	Feb 5, M
Last day to register late or add class	Sept 29, F	Feb 16, F
Last day to file for degrees and credentials and credentials to be granted at end of semester. Without fine	Sept 29, F	Feb 16, F
With fine	Nov 9, Th	Apr 12, Th
Holiday—Washington's Birthday	.....	Feb 19, M
Holiday—Columbus Day	Oct 9, M	
File application for next semester's student teaching (elementary and secondary)	Oct 9–20, M–F	Mar 5–16, M–F
Last day to drop course without penalty	Oct 16, M	Mar 5, M
Holiday—Veterans Day	Oct 23, M	
Spring Recess	.....	Apr 16–20, M–F
Thanksgiving Recess	Nov 23–24, Th–F	
Last day to drop course except for complete withdrawal from college	Dec 18, M	May 11, F
Winter Recess	Dec 20–Jan 1, W–M	
Holiday—Memorial Day	.....	May 28, M
Semester examinations and reading period	Jan 15–24, M–W	May 29–June 6, T–W
Last day to file approved theses at Graduate Office for master's degrees to be granted at end of semester	Jan 17, W	May 30, W
Sixty-second annual Commencement	.....	June 6, W
Final grade reports due. Semester ends	Jan 26, F	June 8, F

Summer Session, 1973 ..... June 18–July 27, inclusive
Post Session, 1973 ..... July 30–August 31, inclusive
Fall Semester, 1973 ..... Sept. 10 M, Semester begins

ADMINISTRATIVE DIRECTORY

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Board of Trustees 8
Chancellor 9
California State University and Colleges 9

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Administration 11
School Deans and Department Chairmen 12

34 1 2 3 170

TRUSTEES OF THE CALIFORNIA STATE UNIVERSITY AND COLLEGES, 1971–1972

EX OFFICIO TRUSTEES

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Governor of California and President of the Trustees

Hon. Ed Reinecke ..... State Capitol, Sacramento 95814
Lieutenant Governor of California

Hon. Bob Moretti ..... State Capitol, Sacramento 95814
Speaker of the Assembly

Hon. Wilson Riles ..... 721 Capitol Mall, Sacramento 95814
State Superintendent of Public Instruction

Glenn S. Dumke ..... 5670 Wilshire Boulevard, Los Angeles 90036
Chancellor of the California State University and Colleges

APPOINTED TRUSTEES

Appointments are for a term of eight years, expiring March 1 on dates in parentheses. Names are listed in order of accession to the Board.

Charles Luckman (1974)
9220 Sunset Blvd., Los Angeles 90069

Mrs. Philip Conley (1972)
3729 Huntington Blvd., Fresno 93702

E. Guy Warren (1973)
P.O. Box 59, Hayward 94541

Daniel H. Ridder (1975)
604 Pine Ave., Long Beach 90801

George D. Hart (1975)
111 Sutter St., San Francisco 94104

Alec L. Cory (1973)
530 B St., Suite 1900, San Diego 92101

William A. Norris (1972)
609 South Grand Ave., Los Angeles 90017

Edward O. Lee (1974)
P.O. Box 23361, Oakland 94623

Karl L. Wente (1976)
5565 Tesla Road, Livermore 94550

Dudley Swim* (1976)
Route 2, Box 5000, Carmel Valley Road, Carmel 93921

W. O. Weissich (1977)
1299 Fourth St., San Rafael 94901

Robert A. Hornby (1978)
P.O. Box 60043, Terminal Annex, Los Angeles 90060

William F. McColl (1979)
1433 West Merced Avenue, West Covina 91790

Wendell W. Witter (1979)
45 Montgomery Street, San Francisco 94106

Mrs. Winifred H. Lancaster (1977)
P.O. Drawer JJ, Santa Barbara 93102

Gene M. Benedetti (1978)
8990 Poplar Avenue, Cotati 94952

OFFICERS OF THE TRUSTEES

Governor Ronald Reagan
President

Karl L. Wente
Chairman

George D. Hart
Vice Chairman

Chancellor Glenn S. Dumke
Secretary-Treasurer

---

* Deceased

OFFICE OF THE CHANCELLOR OF THE CALIFORNIA STATE UNIVERSITY AND COLLEGES

5670 Wilshire Boulevard, Los Angeles, California 90036

Area Code: 213 Phone: 938-2981

Glenn S. Dumke ..... Chancellor
H.E. Brakebill ..... Executive Vice Chancellor
Norman Epstein ..... Vice Chancellor and General Counsel
D. Dale Hanner ..... Vice Chancellor, Business Affairs
Harry Harmon ..... Vice Chancellor, Physical Planning and Development
C. Mansel Keene ..... Assistant Chancellor, Faculty and Staff Affairs
William B. Langsdorf ..... Vice Chancellor, Academic Affairs

THE CALIFORNIA STATE UNIVERSITY AND COLLEGES

California State College, Bakersfield
9001 Stockdale Highway, Bakersfield, California 93309
Paul F. Romberg, President
(805) 833-2011

California State College, Dominguez Hills
1000 East Victoria Street, Dominguez Hills, California 90246
Leo F. Cain, President
(213) 532-4300

* California State College, Fullerton
800 North State College Boulevard, Fullerton, California 92631
L. Donald Shields, Acting President
(714) 870-2011

* California State College, Hayward
25800 Hillary Street, Hayward, California 94542
Ellis E. McCune, President
(415) 844-3724

* California State College, Long Beach
6101 East Seventh Street, Long Beach, California 90804
Stephen Horn, President
(213) 498-4111

* California State College, Los Angeles
5151 State College Drive, Los Angeles, California 90032
John A. Greenlee, President
(213) 224-0111

California State College, San Bernardino
5500 State College Parkway, San Bernardino, California 92407
John M. Pfau, President
(714) 887-6311

* California State Polytechnic College, Kellogg-Voorhis
3801 West Temple Avenue, Pomona, California 91768
Robert C. Kramer, President
(213) 964-6424

* Now California State University

* California State Polytechnic College, San Luis Obispo
San Luis Obispo, California 93401
Robert E. Kennedy, President
(805) 546-0111

* Chico State College
Chico, California 95926
Stanford Cazier, President
(916) ~~345-5011~~ 459-0001

* Fresno State College
Shaw and Cedar Avenues, Fresno, California 93710
Norman A. Baxter, President
(209) 487-9011

Humboldt State College
Arcata, California 95521
Cornelius H. Siemens, President
(707) 826-3011

* Sacramento State College
6000 J Street, Sacramento, California 95819
Bernard L. Hyink, President
(916) 454-6011

* San Diego State College
5402 College Avenue, San Diego, California 92115
Donald E. Walker, Acting
(714) 286-5000

* San Fernando Valley State College
18111 Nordhoff Street, Northridge, California 91324
James W. Cleary, President
(213) 349-1200

* San Francisco State College
1600 Holloway Avenue, San Francisco, California 94132
S. I. Hayakawa, President
(415) 469-9123

* San Jose State College
125 South Seventh Street, San Jose, California 95114
John H. Bunzel, President
(408) 294-6414

Sonoma State College
1801 East Cotati Avenue
Rohnert Park, California 94928
Thomas H. McGrath, President
(707) 795-2011

Stanislaus State College
800 Monte Vista Avenue, Turlock, California 95380
Carl Gatlin, President
(209) 634-9101

* Now California State University

FRESNO STATE COLLEGE ADVISORY BOARD

A group of twelve citizens of Fresno and vicinity appointed by the Trustees of the California State University and Colleges as an advisory body to the administration of Fresno State College.

Mrs. Willie L. Brown
Michael Cardenas
Joseph C. Drilling
Lewis S. Eaton
Lowell W. Firstenberger
James D. Hallowell
Mrs. Jin Ishikawa
William N. Knudsen
Mrs. John W. Pace
Hans C. Sumpf
Harold V. Thompson, Chairman
Richard M. Worrel

Norman A. Baxter, Executive Secretary

AUXILIARY ORGANIZATIONS

Fresno State College Association, Inc.
Fresno State College Foundation
Fresno State College Agricultural Foundation
Director of Related Educational Activities ..... Earle L. Bassett
Assistant General Manager—College Union Director ..... Earl Whitfield
Assistant General Manager—Controller ..... Darrell Foletta

CALIFORNIA STATE UNIVERSITY, FRESNO, ADMINISTRATION *

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Assistant to the President for Campus Affairs ..... William M. Fulkerson, Jr.
Assistant to the President for Community Relations ..... Charles H. Dick (fall)
Director of Public Information ..... James B. Miller
Executive Vice President ..... H. O. Schorling
Executive Dean ..... Marvin B. Wampler
Building Coordinator ..... Frank H. Goishi
Assistant Executive Vice President ..... Harry Earl Jones
Dean of Student Affairs ..... David G. Bell
Assistant Dean of Student Affairs ..... William H. Corcoran
Director of Activities ..... Patrick C. M. Gorman
Director of Counseling and Testing and Coordinator of Faculty Advising ..... Deryle K. Allen
Test Officer ..... Roger L. Bailey
Psychometrist ..... William P. Stock
Director of the Educational Opportunity Program ..... Manuel Perez
Assistant Directors ..... Robert Hernandez, Ernest Shelton
Director of Financial Aids ..... Vernile Matheson
Assistant Director ..... Robert L. Sanford
Director of Housing ..... Robert S. Brooks
Director of Placement ..... Harold D. Jones
Director of Athletics ..... J. Gene Bourdet
Director of Health Services ..... Marvyn S. Schwartz, M.D.
Director of the Computer Center ..... Woodrow W. Shumate
Director of the Instructional Media Center ..... Leonard H. Bathurst, Jr.
Assistant Director ..... Wymond Eckhardt
Research Coordinator ..... Samuel P. Lyles, Jr.
Vice President for Academic Affairs ..... Harold H. Haak
Associate Vice President for Academic Affairs ..... David E. Clark
Assistant Academic Vice President ..... Paul J. McGuire
Assistant Academic Vice President ..... Phyllis A. Irwin
Assistant Academic Vice President ..... John J. McDermott

* As of March 1972.

Dean of Continuing Education and Summer Sessions ..... James A. Fikes
Assistants to the Dean ..... Henry Fricker, Ralph Moody
Dean of the School of Graduate Studies ..... Phyllis W. Watts
Assistant Dean ..... Robert L. Shacklett
Dean of the School of Agricultural Sciences ..... Othmar J. Burger
Assistant Dean ..... George F. Ilg
Dean of the School of Business ..... Robert E. Hampton (acting, spring)
Assistant Dean ..... Allen M. Agnew (spring)
Dean of the School of Education ..... Ralph F. Evans
Director of the Division of Engineering ..... James H. Smith
Dean of the School of Humanities ..... James F. Light
Dean of the School of Natural Sciences ..... Burke Zane (acting)
Dean of the School of Professional Studies ..... Arthur H. Margosian
Assistant Deans ..... Octavio J. Tocchio, Phillip N. Walker
Dean of the School of Social Sciences ..... Charles F. Denton
Dean of the School of Social Work ..... Irving B. Tebor (acting)
College Librarian ..... Henry M. Madden
Director of Admissions and Records ..... T. Russell Mitchell (acting)
Registar ..... Robert R. Board
Director of Institutional Research ..... Harold L. Best
Faculty Coordinator of Data Processing ..... Irvin H. Kral
Coordinator of Honors Program .....
Coordinator of Television ..... John P. Highlander
Director of the Experimental College ..... James A. Brouwer
Coordinator, Overseas International Program ..... Paul F. Kinzel
Director of Business Affairs ..... Carl Levin
College Financial Manager ..... Henry Roberts
Accounting Officer ..... Robert McPeek
Budget Officer ..... Robert S. Nash
College Auditor ..... Tom L. McGonagill
Coordinator—Student Loans ..... Lee Spencer
College Police Chief ..... Douglas F. Bambridge
Director of Personnel ..... William M. Coughran
Director of Academic Personnel Services ..... Larry E. Smith
Training Coordinator ..... R. Douglas Calhoun
Classifications Coordinator ..... James Forden
Safety Coordinator ..... Edward Roddy
Affirmative Action Coordinator ..... Walter J. Pierce
Director of Residence Halls and Management Systems ..... Bruce Moore
Procurement and Services Manager ..... Ralph D. Koerber
Procurement Officer ..... Everett R. Guyett
Superintendent of Buildings and Grounds ..... Ashton H. Shields

SCHOOL DEANS AND DEPARTMENT CHAIRMEN

School of Agricultural Sciences ..... Othmar J. Burger
Agricultural Economics Department ..... Thomas Gunn
Agricultural Industry and Education Department ..... Richard Norton
Animal Science Department ..... Jesse T. Bell
Plant Science Department ..... Harry P. Karle
School of Business ..... Claude E. Elias Jr. (fall); Robert E. Hampton (acting, spring)
Accounting and Quantitative Studies Department ..... Clayton R. Tidyman
Finance and Industry Department ..... Robert A. Carr
Management and Marketing Department ..... John H. Kruger
Office Administration Department ..... Berle Haggblade
School of Education ..... Ralph F. Evans
Advanced Studies Department ..... Orley W. Wilcox
Elementary Education Department ..... Arne J. Nixon
Secondary Education Department .....
Division of Engineering ..... James H. Smith (Director)

School of Humanities ..... James F. Light
Art Department ..... Wesley M. Williams (fall); Frank B. Laury (spring)
English Department ..... Lillian Faderman
Foreign Language Department ..... Jose A. Elgorriaga
Linguistics Department ..... Edward R. Gammon
Philosophy Department ..... J. Marvin Smith
School of Natural Sciences ..... Burke Zane (acting)
Biology Department ..... Keith M. Standing
Chemistry Department ..... Stephen A. Rodemeyer
Geology Department ..... Bruce A. Blackerby
Mathematics Department ..... Donald J. Donohue (acting)
Physics Department ..... Michael J. Zender
Psychology Department ..... Wayne B. Holder (acting)
School of Professional Studies ..... Arthur H. Margosian
Aerospace Studies Department ..... Alastair W. Thompson
Allied Health Professions Program ..... Edward Berg (Director)
Communicative Disorders Department ..... Jon M. Fitch
Criminology Department ..... Frank M. Boolsen
Health Science Department ..... Henry F. Fricker
Home Economics Department ..... Carlene Rose
Industrial Arts and Technology Department ..... Frank E. Schroeter
Journalism Department ..... John H. Duke
Music Department ..... Wilson W. Coker
Nursing Department ..... Mary G. Patterson
Physical Education—Recreation ..... J. Gene Bourdet
Radio-Television Department ..... John H. Highlander
Theater Arts Department ..... Gaylord A. Graham
School of Social Sciences ..... Charles F. Denton
Anthropology Department ..... Sydney R. Story
Economics Department ..... Izumi Taniguchi
Ethnic Studies Program .....
Black Studies ..... Lester Riggins (Coordinator)
La Raza Studies ..... Alexander Saragoza (Coordinator)
Geography Department ..... Richard C. Montgomery
History Department ..... Peter J. Klassen
Political Science Department ..... John A. Rotstan
Sociology Department ..... S. John Dackawich
Speech Communication Department ..... Ralph L. Hennings
Urban and Regional Planning Department ..... Harold H. Tokmakian
School of Social Work ..... Irving B. Tebor (acting)
Social Welfare Department ..... Ganesha Visweswaren
Graduate Department of Social Work .....
School of Graduate Studies ..... Phyllis W. Watts

LIBRARY

College Librarian ..... Henry M. Madden
Librarian V ..... Stephanie Hillman, Lillie A. Parker
Librarian IV ..... Sandra L. Cowling, Vincent J. Smith, Jr.
Librarian III ..... Sara C. Berry, A. Zane Clark, A. Gerald Gothe, Ronald J. Harlan, William F. Heinlen, Ann Hopping, Erland L. Jacobsen, Charlotte M. Lowery, Ronald J. Mahoney, Grace T. Waibel
Librarian II ..... Charles V. Dintrone, Thomas J. Ebert, Herbert S. Fox, Marian Goslinga, Susanne A. Haffner, Marilyn M. Hsu, Minerva S. Linden, Kern T. Majors, Eugene Mescherin, Colleen A. Mitchell, Diane L. Mosher, William J. Petesch, Bertina Richter, T. Edward Ross, Marilyn Zitterkopf
Librarian I ..... Christy V. Hicks

GENERAL INFORMATION

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THE CALIFORNIA STATE UNIVERSITY AND COLLEGES

On November 29, 1971, the Governor signed into law Assembly Bill 123 which created The California State University and Colleges, thereby redesignating the system previously known as the California State Colleges. This legislation provided legal recognition that the California State Colleges have achieved the status of universities in their first decade as a unified system of higher education.

First brought together as a system under an independent Board of Trustees by the Donahoe Higher Education Act in the early 1960's, the California State University and Colleges now consists of nineteen campuses, covering the state from Humboldt in the north to San Diego in the south. Current enrollment exceeds 263,000 full- and part-time students, with a faculty of approximately 14,500.

Responsibility for the California State University and Colleges is vested in the Board of Trustees, whose members are appointed by the Governor. The Trustees appoint the Chancellor, who is the chief executive officer of the system, and the Presidents, who are the chief executive officers on the respective campuses.

The Trustees, the Chancellor, and the Presidents develop systemwide policy, with actual implementation at the campus level taking place through broadly based consultative procedures. The Academic Senate of the California State University and Colleges, made up of elected representatives of the faculty from each campus, recommends academic policy to the Board of Trustees through the Chancellor.

Each campus in the system has its own 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 and professional needs of the State of California. A limited number of joint doctoral programs are also offered. Although there is increasing recognition of the importance of research to the maintenance 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 been established, and sites have been selected for additional campuses in Ventura, San Mateo, and Contra Costa counties. California State College, Bakersfield, the newest, was opened to students in 1970. Enrollment in the system is expected to pass 300,000 by 1980.

CALIFORNIA STATE UNIVERSITY, FRESNO

The California State University, Fresno, a liberal arts college, is one of the 19 campuses administered by the Trustees of the California State University and Colleges. It is dedicated to academic excellence, integrity, and freedom. It is committed to developing competent students, citizens, and leaders and to serving the Fresno and Valley communities. The college offers programs of instruction through the master's degree in the liberal arts and sciences, in the professions, in applied fields, and in special and interdisciplinary areas. It also provides further educational opportunities to individuals, public agencies, school systems, private business, and agriculture through the continuing education, in-service education, and research programs of the college.

HISTORY

Fresno State is the sixth oldest in the California State University and College system. It has developed from the establishment of the first junior college in California in 1910 and a state normal school in 1911 which, under a single administration, offered two-year programs in general and vocational training and in teacher preparation. Between 1911 and 1921 a campus was built on University Avenue, then the northern border of Fresno. In 1921 the college became Fresno State Teachers College, authorized to offer a four-year program and to grant the bachelor of arts degree in teaching. In 1935, by act of the Legislature, the official designation became Fresno State College, and the college was authorized to offer a variety of degree programs in addition to those related to the teaching credential. Following World War II, expansion was accelerated, both academically and physically. The first master's

degree was offered in 1949; today it is offered in 37 fields of study.

Between 1953 and 1958 the college was moved from the old campus site, by then surrounded by the City of Fresno, to a 1410-acre site six miles to the northeast. In 1961, under the newly created California State College system, the administration and control of the state colleges was transferred from the State Board of Education to an independent board, the Trustees of the California State Colleges. An approximation of university organization was effected during the years between 1965 and 1968 through the organization of the college into seven schools and the Division of Engineering. The schools, each with its own dean, included Agriculture, Arts and Sciences, Business, Education, Professional Studies, Social Work, and Graduate Studies. Further reorganization resulted in the division of the School of Arts and Sciences into the School of Humanities, School of Natural Sciences, and the School of Social Sciences.

Fresno State College in 1911 had an enrollment of 150 students, most of whom were women. By 1940 the enrollment had increased to 2,000 students, by 1964, to 7,500. In the fall of 1971 more than 14,000 students registered and by 1980, it is expected that about 22,000 will be attending the Fresno campus.

The Presidents of Fresno State, in order of tenure are: Charles L. McLane (1911–1927), Frank W. Thomas (1927–1948), Arnold E. Joyal (1948–1964), Frederic W. Ness (1964–1969), Karl L. Falk (Acting) (1969–1970), and Norman A. Baxter, who has served since 1970.

ACCREDITATION

The California State University, Fresno is accredited by
The California State Board of Education,
The Western Association of Schools and Colleges,
The National Council for Accreditation of Teacher Education.

The college is a member of
The Western Association of Graduate Schools,
The Council of Graduate Schools in the United States,
The American Association of Colleges for Teacher Education.

Departmental and area accreditations, certificated memberships, and accrediting organizations include

Allied Health Professions	Association of Schools of Allied Health Professions
Business	American Association of Collegiate Schools of Business
Chemistry	American Chemical Society
Engineering (Civil, Electrical, Mechanical)	Engineering Council for Professional Development
Health Science (Sanitarian)	State Department of Public Health
Home Economics (Dietetics)	Approved for admission to internship program of the American Dietetics Association
Journalism (News-Editorial)	American Council of Education for Journalism
Music	National Association of Schools of Music
Nursing	National League for Nursing
Social Work	Accreditation by the Council on Social Work Education; and undergraduate and graduate membership in the Council

FACILITIES

The University is located at Cedar and Shaw Avenues in the northeast section of the City of Fresno. Its 1410 acres provide for the expansion of facilities necessitated by a continually increasing enrollment. When the Shaw Avenue location was first occupied, during the 1953–54 academic year, there were only four completed buildings on what was then an 880-acre site. Ten years later, in 1963–64, major buildings on campus included administration, agricultural classroom, agricultural mechanics, home economics, bookstore, business, cafeteria, education-psychology, engineering, home management cottage, industrial arts, library, gymnasiums for men and women, music science, social science, speech arts, student health service and the first residence halls. Between 1964 and the fall of 1971, the addition of student administration, residence hall commons, classroom and office buildings, a three-story college union, new bookstore, and a new art building of contemporary design

have provided some much-needed space and facilities. There are now more than 45 buildings in service. Plans for the future include east campus residence halls, additions to the business, engineering, health center, and science facilties, as well as a new residence hall dining area.

The buildings are in a setting of colorful trees, shrubbery, flowers, and lawns. A tree-lined amphitheater accommodates commencements, convocations, and other large assemblages and provides an outdoor setting for numerous programs and gatherings during the year. A centrally located memorial court, benches, and fountain are favorite spots for relaxation. The adjacent free speech area and college union are centers of student life and activity.

A college farm operated by the School of Agricultural Sciences has more than 34 structures and is considered one of the most modern and best equipped agricultural plants in the west. The properties of the college also include the Ratcliffe Stadium and the University Avenue Extension Center, both off-campus.

COMPUTER CENTER

The Fresno State Computer Center is designed to serve all information processing and computation needs of the college including instruction, research, and administration. It also provides a variety of direct and indirect free services to students. Technicians are available in the Instructional Laboratory to give assistance and training in the use of facilities and computer programming and the laboratory provides timesharing terminals, keypunches, and sorters for students. Approximately 25% of the students now make substantial use of the facilities. Use of the computers in the instructional program is increasing at the rate of 125% annually. The Center is temporarily located in the west wing of the School of Business Building, pending construction of a new building. The system supports most of the major computer languages and, via a teleprocessing circuit, has access to other larger computers and to a statewide interactive timesharing network.

Students planning to use the facilities should purchase a Computer Center User's Manual at the bookstore.

LIBRARY

The Library is housed in a building completed in 1965. Its resources include 343,000 catalogued volumes, 142,000 government publications, 37,000 pamphlets, 41,000 maps, 26,000 pictures and prints, and over 3,900 periodicals are received on subscription. Special collections include the Roy J. Woodward Memorial Library of Californiana and the Archives. The Music Library has over 22,000 phonodiscs and tapes. The library building accommodates 11,142 readers. All students have free access to the resources of the Library. Professional librarians are available to assist students in their use of library materials. The Library is open eighty-three hours a week, during hours posted at the entrance to the building.

CONTINUING EDUCATION AND SUMMER SESSIONS

Note: Students enrolling in summer session or extension are not required to be officially admitted to the university. Graduate students see also School of Graduate Studies.

EXTENSION CLASSES

The university offers a wide variety of extension courses to assist in meeting the educational needs of the four-county service area. Courses are arranged in an area when the student demand is adequate to finance the instruction. Matriculation is not required for enrollment.

Unit Restrictions

Baccalaureate degree: Extension and correspondence credit limited to 24 units; transfer credit limited to 12 units.

Master's degree: Extension, transfer, and correspondence credit limited to a maximum of 6 units of the 30 units required for the degree. (Consult the Graduate Office for information concerning the use of specific courses.)

The university permanent records will show extension work only at the request of the matriculated student. For information regarding courses, course fees, and instructional costs, write to the Dean of Continuing Education and Summer Sessions, California State University, Fresno.

SUMMER SESSIONS

Summer sessions are conducted at Fresno State beginning at the close of the spring semester. The second session includes classes held on the Fresno campus, at Visalia, and at other valley locations. Completion of a maximum of eleven weeks is possible in a single summer. Only one semester unit may be earned for each week of attendance except that, upon approval of the appropriate university authorities, additional units may be earned at the rate of one-half semester unit for each three units for which a student is registered in a three-week period.

The courses offered are planned to meet the requirements of baccalaureate and master's degree program, credential programs, the needs of in-service professional people, and to provide for intensive practical work in areas such as music, drama, and fields of education.

A Summer Session Bulletin is published each March. For information, write to the Dean of Continuing Education and Summer Sessions, California State University, Fresno.

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STUDENT AFFAIRS

Student Affairs provides an organized administration of educational services designed to support the instructional program. These services include student activities, counseling and testing, the Educational Opportunity Program, financial aids, foreign student assistance, housing, and placement services. The program also provides students with nonclassroom experiences which are primarily of an educational nature, such as general orientation to the college, cultural enrichment, and tutorial projects. The program and individual services are described in more detail in the following sections of this catalog.

STUDENT ACTIVITIES OFFICE

The Student Activities Office, Room 286 of the Student Administration Building, provides services invaluable to the student who wishes to use them The office publishes a weekly list of activities and maintains a master calendar of events for the entire school year. It provides information about campus organizations or the formation of new organizations on campus. Through the office, recognized student organizations may reserve facilities for meetings and other functions and obtain help in requisitioning audio-visual equipment when needed; students may obtain permits to distribute goods or literature on campus; information is available concerning new student orientation, the Child Day Care Center, student government, commencement ceremonies, and many other aspects of college life.

COUNSELING AND TESTING

ADVISING

Admissions Advising. The Admissions Office provides counseling to assist students in making application, in understanding admission requirements, and in utilizing the services of the college during the admissions process. Problems concerning evaluation of previous academic records should be directed to the Director of Admissions and Records.

Academic Advising. Each student is assigned to a faculty adviser who is a member of the academic department of the student's chosen field. The student uncertain of his choice of an academic major is assigned to a general adviser until a definite goal is chosen. A faculty adviser assists a student in planning his program of classes and in planning for the achievement of his long-range educational goals. The student, however, is expected to assume final responsibility for meeting all specific degree and/or credential requirements. The academic advising program is coordinated and serviced through the Counseling Center.

STUDENT COUNSELING CENTER

The Student Counseling Center is staffed by full-time professional counselors and psychologists whose services are available, without charge, to all students desiring assistance. Matters discussed by the student and counselor are held in strict confidence.

Educational Counseling. The Counseling Center assists students who are having academic difficulties, those who are uncertain regarding their educational goals, and those who need information about educational requirements and programs.

Vocational Counseling. The Counseling Center assists students in self-appraisal of their unique interests and aptitudes and determining their vocational goals. Psychological and vocational tests are used as needed. A library of vocational information is provided; also, each academic department provides vocational advising pertinent to its field.

Personal Counseling. Counselors and psychologists help students who are concerned about personal matters. The emphasis is upon the student's personal growth and development.

Group Counseling. The Student Counseling Center provides opportunities to enter groups of from 8 to 12 students sharing the desire to grow and develop in self-awareness and sensitivity to other people's needs and feelings, and to find meaning and relevance for themselves in their relationship to others.

Draft (Selective Service) Counseling. The Center provides group and individual draft counseling to students seeking an appropriate response to their selective service obligation. Up-to-date draft counseling bulletins are also made available monthly in order to keep students informed about changes in selective service system procedures.

EDUCATIONAL OPPORTUNITY PROGRAM

The Educational Opportunity Program at Fresno State is designed to assist capable young people from minority or low income groups who wish to acquire a college education but cannot because of a variety of financial or academic reasons. Acceptance into EOP is based upon an evaluation of the student's past educational experience, letters of reference, and an autobiographical sketch. The program offers such assistance as tutoring, counseling, housing, and financial aid to insure that students admitted to the program will succeed. (See also *Financial Aids).*

FINANCIAL AIDS

Scholarships and Grants

About 300 scholarships and grants totaling approximately $68,000 will be available for the 1972–73 academic year. About half of these scholarships, ranging from $50 to $1,000, are open to new students. The average scholarship is for $200 for the year and covers the cost of material and service fees, student body fees, and a partial cost of books. Generally, upper division and specialized scholarships are in larger amounts. The scholarship program is designed to provide deserving students with educational opportunities not otherwise possible. Scholarships are awarded on a competitive basis, consideration being given to scholastic attainment, academic potential, financial need, and character; some are available on the basis of outstanding accomplishment in specialized fields.

Scholarship awards are announced late in May of each year. Students, both entering and enrolled, should file applications with the Director of Financial Aids prior to March 1st. New students must include transcripts of high school and all college work completed to date. Entering students who wish to be considered for awards of over $100 must also submit a Parents' Confidential Statement through the College Scholarship Service or a Family Financial Statement through the American College Testing Organization. These forms may be obtained from the high school counselor or from the Fresno State College Financial Aids Office. One application is sufficient for all available scholarships. A brochure giving information on financial aids for graduate students may be obtained from the Dean, School of Graduate Studies.

Waivers of Nonresident Fees

With verification by the Executive Vice President, *children or spouses of California State University and College employees,* who are not yet legal residents of California, may be exempted from the nonresident fee.

With verification by the Dean of the School of Education, *certificated California school district employees* who are not yet legal residents of California, may be exempted from the nonresident fee if they are provisionally credentialed and working toward regular credentials, completing postponed requirements, or completing the fifth year required under the *Licensing of Certificated Personnel Law of 1961.*

Surviving children, natural or adopted, of California peace officers or firemen killed in the line of duty are not charged fees or tuition of any kind while enrolled at any California State University or College, according to the *Alan Pattee Scholarship Act* and the *Education Code,* Section 23762. Students qualifying for these benefits are known as Alan Pattee scholars.

College Association and Foundation Loan Funds

The college maintains a number of loan funds providing financial aid to students. Loans are granted on the basis of the student's financial need, his educational program and his ability to repay his obligation to the loan fund. Most of the loan funds provide limited aid to students on an emergency basis. However, larger loans are available to senior and graduate students. These loans may be repaid after completion of the degree or credential work. The Fresno State College Association Loan Fund is administered by the Fresno State Business Office. The other loan funds are held in trust by the Fresno State College Foundation. These loan funds, in general, are not available to entering students.

Applications for loans are processed through the Director of Financial Aids, California State University, Fresno, Fresno, California 93710. For detailed information, see the Financial Aids Bulletin.

The Alumni Trust Council Loan Funds

A number of loan funds are administered by the Fresno State College Alumni Trust Council, Inc. These loans, available in varying amounts, are repaid on terms arranged with the student at the time the loan is made. Further information may be obtained from the Financial Aids Office on the campus. Loans granted from these loan funds may be repaid after graduation.

National Defense Student Loan Program

Fresno State participates in the federal loan program which is provided for in Title II of the National Defense Education Act of 1958. Under this program needy undergraduate students in any field of study may borrow up to $1,000 a year, for a maximum of $5,000, and needy graduate students may borrow up $2,500 per year, for a combined maximum of $10,000. Students carrying at least a one-half academic workload are eligible to receive loans. Students entering college for the first time as well as continuing students are eligible to apply for this type of loan.

No interest is charged until nine months after the borrower ceases to be at least a one-half time student. Interest at the rate of 3% of the remaining balance begins at the end of the nine-month grace period and the first payment is due three months later. Payments may extend for a period of not more than ten years, but will be at a rate of not less than $15 per month.

A borrower who becomes a full-time teacher in a public or private nonprofit elementary or secondary school or in an institution of higher education may have up to 50 percent of his loan cancelled. A borrower who becomes a teacher in a public or other nonprofit elementary or secondary school in which there is a high concentration of low income families or who becomes a teacher in special education (hard of hearing, mentally retarded, cerebral palsy, etc., classes) may have 15 percent of the loan cancelled for each year of teaching service up to 100 percent of the loan. A borrower shall receive cancellation for service after June 30, 1970, as a member of the United States Armed Forces, at the rate of 12½ % per year for a total of 4 years. This cancellation shall be for loans made after April 14, 1970.

Inquiries should be directed to the Financial Aids Office, California State University, Fresno, Fresno, California 93710.

Law Enforcement Assistance Loans and Grants

Students working toward a degree in law enforcement or corrections or who are actively engaged in law enforcement or corrections and wish to return for further training, may apply for a Law Enforcement Assistance Loan of up to $1800 a year. Loans will be made on a basis of financial need. A loan recipient may have 25% of the loan cancelled up to 100% of the loan for each year of full-time employment by a public, local, state, or federal law enforcement or corrections agency. Applications should be made to the Financial Aids Office by March 1st.

Grants of up to $300 a semester may be made to assist full-time or part-time students in a graduate or undergraduate program who are employees of any publicly funded law enforcement or corrections agency and who are in college for professional improvement. Applications should be made to the Financial Aids Office by March 1st.

Nursing Student Loans and Scholarships

Under this program, a student who can show that a loan is needed to enter or continue in the nursing program may borrow up to $1500 an academic year or its equivalent, with an aggregate maximum of $6000. Preference will be given to licensed practical nurses in selecting loan recipients. No interest is charged for periods up to 5 years while the borrower pursues a full-time course of study in a collegiate school of nursing leading to a baccalaureate or graduate degree in nursing, or is otherwise pursuing advanced professional training in nursing, or for a period of 9 months after leaving school. Interest then starts at 3% simple interest and the loan is repaid at not less than $15 per month. A borrower who enters full-time professional nursing may have up to 50% of the loan cancelled at the rate of 10% for each year of full-time nursing or up to 100% at the rate of 15% for each year of full-time service by the borrower as a professional nurse in a public or other nonprofit hospital in an area determined, in accordance with regulations of the Secretary of the Department of Health, Education, and Welfare, to have a substantial shortage of such nurses at such hospitals. Interest and payments are deferred for periods up to 3 years of active duty performed by

the borrower as a member of the uniformed service or spent as a volunteer under the Peace Corps Act. Applications for these loans should be made by March 1st for the following year.

Students of exceptional financial need accepted for enrollment or enrolled as full-time nursing students will be eligible to receive assistance under this program. Scholarships may be awarded up to $1500 a year, or the amount of the student's financial need, whichever is less. Application for these scholarships should be made by March 1st for the following year.

Federally Insured Student Loan Program

Under this program a student may borrow up to $1500 yearly from a commercial lending institution with repayment guaranteed by the federal government. If the adjusted family income is under $15,000 a year, the federal government may pay the interest during the time the student is in school carrying a full-time load and during the grace period of 9 to 12 months after the student leaves school. Applications for loans are available in the Financial Aids Office.

Work-Study Program

Fresno State participates in the federal Work-Study Program as provided in the Economic Opportunities Act of 1964. Students who qualify may be offered employment. A standard financial aids application is required prior to March 1 of each year.

Educational Opportunity Grants

Fresno State participates in the Educational Opportunity Grant Program as provided in the Higher Education Act of 1965. These grants must be equally matched with other institutional aid. Students who qualify will receive grants ranging from $200 to $1000. Applications for grants may be obtained from the Financial Aids Office, California State University, Fresno. The application deadline is March 1.

State and Federal Aid to Veterans

The office of the Dean of Student Affairs maintains liaison with the Veterans Administration and the State Department of Veterans Affairs. The Director of Financial Aids at the college assists veterans in conducting their affairs with these agencies.

Students planning to enroll and obtain benefits under Public Law 634 or 361 (War Orphans Education Act) should obtain a Certificate For A Program Of Education (VA Form VB22-5493) from the Veterans Administration and present it to the Director of Financial Aids at the time of registration.

Students planning to enroll and obtain benefits under Public Law 358 (Cold War GI Bill) should obtain a certificate for a Program of Education (VA Form 22-1993) from the Veterans Administration and present it to the Financial Aids Office at the time of registration.

The college is also approved for the training of disabled veterans (Public Law 894 or 815). Veterans who plan to attend the college on this program should notify the Veterans Administration of their intentions to enter Fresno State well in advance of the registration period.

Veterans' dependents planning to attend the college under benefits available from the State of California (Cal-Vet) must obtain the required authorization each semester from the State Department of Veterans Affairs, Box 1559, Sacramento, California.

Information on the above educational programs at the college may be obtained by writing to the Director of Financial Aids.

State Aid to the Handicapped

The State of California, through its Vocational Rehabilitation Service, provides financial assistance to students, both civilian and military, who have physical or emotional disabilities. This assistance equals the necessary school expenses and may include an additional amount to help cover the cost of living. Students who may be entitled to this assistance should apply to the Vocational Rehabilitation Service, 2550 Mariposa, Fresno, California 93721.

Graduate Assistantships

A limited number of graduate assistantships are available to graduate students who are enrolled in the master's degree program and whose previous records show outstanding achievement in academic work, outstanding subject matter competence in the major field, and the special qualities necessary to the duties assigned. A beginning graduate assistant may

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receive a stipend of $2300 for the academic year. Some assistantships may be for reduced time and carry prorated stipends. For information write to the Dean, School of Graduate Studies, specifying field of graduate study and any special abilities that might justify assignment as a graduate assistant.

Residence Assistantships

The college employs a number of students as assistants in its residence hall program. These positions are available to graduate students whose interest and background indicate competence in this type of work. The stipends vary, depending upon the work assignment. Generally they cover the cost of residence hall room and board. Interested graduate students may obtain further information from the Director of Housing.

INTERNATIONAL (FOREIGN) STUDENTS

California State University, Fresno, regularly enrolls a significant number of students from abroad. The International Student Counseling Office staff, under the direction of the Student Counseling Center, assists foreign students with academic and personal problems, and housing (see *Student Housing*), as well as governmental and legal aspects of their stay. A special orientation program is planned and required of all foreign students prior to registration each semester. Students should notify the International Student Counseling Office of their arrival plans and consult them immediately upon arrival on campus for verification of enrollment, orientation, and assistance (see *General Information—Admission to the University*).

Students from abroad must have sufficient understanding and proficiency in use of the English language to be successful in their course work at Fresno State College (see *Entrance Examinations*). A special program of English language and American studies courses is available to assist students whose previous instruction has been in a language other than English. (See *International Studies—Campus Program*). Except for the few who are employed as graduate assistants, students must have sufficient funds so that they will not need employment during the first year at the college and should plan to register for the minimum legal number of courses each semester, which for undergraduate students on "F" or "J" type visas is 12 units and for graduate students is 6 units. These are the minimum-unit loads foreign students must carry in order to keep their student visas valid. They are also required to participate in the college health insurance program or demonstrate adequate health insurance coverage at the time of registration.

The International Student Counseling Office also coordinates campus and community activities for foreign students. These are designed to enhance their educational experiences in the United States. Students should consult the International Student Counseling Office for information pertaining to these activities. Foreign graduate students should refer to the *School of Graduate Studies.*

STUDENT HOUSING

Residence Halls

The college can accommodate 1,258 students in the residence halls on campus. Three types of rooms are available: single, double, and suite. A suite consists of three regular double rooms plus a living-study room and private bath. Rooms are attractively furnished and provide pleasant study and living facilities. The halls also have special lounge areas, recreation rooms, study rooms, and laundry facilities. Food service is provided by the college cafeteria. A choice of board plans is available, allowing the resident to choose the one which meets his needs and budget. The hall governments sponsor an extremely active and varied program of activities.

Residents must agree to live in the halls for the academic year. For information on residence hall costs, see *Fees and Expenses.* Further information and applications for reservations may be obtained by writing to the Housing Office. Application forms are available after April 1. Students who are applying for accommodations in the halls must also file an application for admission to the college unless already enrolled.

Off-Campus Housing

Students are advised to make arrangements for housing as early as possible before registration. The Housing Office maintains a file of available off-campus living accommodations. A large number of apartments are available in the area adjacent to the campus. Accommodations are also provided by private homes in the area, with a limited number offering room and board.

Some information on apartment rentals may be sent through the mail. Most listings and information available in the Housing Office are kept in loose-leaf binders because of rapid turnover; students must visit the office in person to consult these files. Students are also advised to inspect the premises in person before signing a lease. The college does not inspect or supervise any off-campus housing.

Housing for Married Students

The college does not maintain housing facilities for married students and their families. However, some low-cost housing is available through application to the Fresno City and County Housing Authority, 2520 E. Clinton Avenue, Fresno, California 93703.

The Housing Office also maintains a file of privately owned rentals, some of which are near the campus. These private rentals range from $85 to $300 per month depending on size, furnishings, and location.

PLACEMENT SERVICE

The college maintains a centralized placement service which is closely integrated with the total educational process of the college. It operates in cooperation with the various departments of the college. Its services include educational, business, industrial, governmental, and student placement.

The placement service seeks more efficient utilization of college manpower by assisting students and alumni in obtaining positions which will best use their education, training, experience, and abilities and by aiding them in their progress toward positions of greater responsibility and personal satisfaction. It not only serves the needs of the college and its students but is vitally concerned with and directs its service toward the needs of the community, business, industry, government, the public school system, and the State generally.

The specific functions of the office are to collect and make available to prospective employers personal data and confidential letters of reference of candidates, to maintain a current record of employment opportunities, to recommend candidates for positions at the request of employers, to arrange for interviews between candidates and employers, to provide guidance to candidates seeking positions, to bring the needs of the employer to those who design and implement the educational program, and to conduct a follow-up program of candidates placed in positions.

Each student and qualified alumnus has the right to participate in the placement program of the college in accordance with established policies. This participation includes the opportunity to meet representatives of business, industry, social agencies, government, all branches of the military, and of education. Employers must be engaged in a legal operation, have bona fide employment opportunities, agree to adhere to standards of ethical conduct, and to participate as stipulated by the Placement Center.

There is no charge to students or employers for the placement service. Within the limitations of time and staff, an effort is made to assist those who seek the service; however, placement cannot be guaranteed. The college reserves the right to recommend for placement only those applicants who are adequately qualified for positions they seek.

Educational Placement

Participation in this program is open (1) to anyone who holds or will receive a regular teaching credential in the semester prior to date of employment provided a minimum of 24 semester units of work has been completed at Fresno State; (2) to anyone who holds or will receive a master's degree in the semester prior to date of employment provided a minimum of 24 semester units has been completed at Fresno State; (3) to students who have met the Fresno State conditions for partial fulfillment of requirements for elementary and secondary teaching under the credential law, including student teaching; and (4) to those in the

internship program who complete requirements for a credential.

Business, Industrial, and Governmental Placement

Participation in this program is open to all graduating seniors and alumni who desire full-time positions in agriculture, business, industry, governmental agencies and other related fields. Seniors are urged to complete and file a personal data sheet with the Placement Center early during the year in which they expect to graduate. Close cooperation is maintained with the various schools and departments in the placement of candidates in these fields.

Student Placement

Participation in this program is open to any enrolled student. Many students earn part of their college expenses. Entering freshmen, however, should be prepared to finance their first semester of college without working; all students should keep their outside employment to a minimum in order to avoid endangering either health or academic achievement.

Various types of employment are available including a number of hourly jobs in various work areas on campus for candidates with specific abilities. Other positions of a temporary nature are also available. Active immunization against tetanus (available through the Student Health Service) is required for any student employed on the College Farm. Off-campus positions range from short-term positions to those with scheduled hours for the full year. Students desiring work on or off campus should consult the Student Placement Center. Employed students are expected to reflect credit on the college. (See also *Work-Study Program* and *Graduate Assistantships.*)

STUDENT LIFE

University students are expected to assume the responsibilities for personal conduct appropriate to their age and maturity. Wide freedom is therefore granted by the administration to the students as individuals and as organized groups. This responsibility has been accepted in an admirable way by the students of the college, and an unusual degree of self-government has been established. A student court has authority to deal with cases involving interpretation of student regulations or their violation. A committee on student life composed of faculty and students evaluates the student life program and makes recommendations on policy and procedure. Regulations as to satisfactory scholarship, disqualification for unsatisfactory work and related questions bearing upon academic requirements are administered in accordance with university policies.

FRESNO STATE COLLEGE ASSOCIATION, INC.

All students enrolled at Fresno State are members of the Fresno State College Association, Inc., a nonprofit corporation chartered by the State of California to operate campus auxiliary services and other association-financed activities. The membership fee, paid at the time of registration, is $10 for students carrying at least eight units and $5 for students carrying seven units or fewer. A nontransferable membership card is issued which permits participation in association activities and admission to all association programs either without charge or at a reduced fee. Faculty members are also eligible for membership. Association fees support athletic activities; publications; music, drama, and cultural programs; and student government activities. The Board of Directors, composed of faculty members and students, exerts budgetary control and determines management policy for all association operations, including the bookstore, the cafeteria, the college union program, and other activities involving expenditure of association funds.

STUDENT PUBLICATIONS

Membership in the Fresno State College Association, Inc., entitles the holder to copies of the three major student publications. The *Daily Collegian* is the official news publication. A directory, appearing soon after the fall semester opens, contains an address list of Fresno State students. The college literary magazine, *Backwash,* is published once each semester and is available to students at a nominal charge. These publications are under the general control of a nine-member board of publications composed of faculty and students.

STUDENT ORGANIZATIONS

Student organizations are encouraged, and over 100 of them representing various fields of social, academic, vocational, and professional interests have been granted recognition. Nine national social fraternities and six national social sororities exist on the campus and operate group-living units. Religious interests are served by the college religious centers adjacent to the campus. These many and varied types of organization not only offer an opportunity for social life but also make a fine contribution to the development of student leadership. Further information may be obtained from the Student Activities Office.

Honor Societies

In addition to high standards of scholarship expected of all students, special recognition is given to superior scholarship. The honor society of Phi Kappa Phi, a national scholarship organization, was established at Fresno State College in 1953. Most departments of the college sponsor honor societies, many of them national in scope, in which membership is based upon superior college work. The Blue Key National Honor Fraternity for men and the Tokalon Honor Society for women offer membership to students who have good scholarship, are prominent in college activities, and who have demonstrated leadership in student affairs.

FOOD SERVICE

The Fresno State College Association, Inc., operates the college cafeteria, residence hall dining room, staff dining room, and the College Union coffee shop. The residence hall dining room and College Union coffee shop are open seven days per week. The Roundup, on Barstow near Maple Avenue, provides snack bar service and sells products of the college farm.

ALUMNI ASSOCIATION

The Alumni Association has a program designed to advance the welfare of the university, to promote common interests of its students and alumni, and to serve as a liaison between the college, alumni, and the community. The self-directed group sponsors numerous activities during the year, provides scholarship assistance to students, and supports the development of the university. Membership is open to graduates and to any student who has attended one or more semesters at Fresno State. Annual dues are $10; life memberships are $100.

The Fresno State College Alumni Trust Council is a charitable organization which receives contributions from alumni and friends of the college. Funds received by the Trust Council are used to support scholarships and programs of the Association, and to promote the welfare of the university.

THE COLLEGE UNION

The College Union building was designed to serve the entire campus community. This new structure was planned by students and is financed by student funds through the Fresno State College Association. The College Union is the campus community center for students, faculty, staff, and guests. In addition it provides convenient and inexpensive social and recreational opportunities. The building includes conference and meeting rooms, lounge areas, a coffee shop, a barber shop, art display areas, student government and committee offices, auxiliary organization offices, bowling and recreation areas, and numerous service facilities.

STUDENT LEADERSHIP

Membership and active participation in a reasonable number of student organizations are strongly recommended by the college. Student groups of this type are an excellent means of obtaining experience in leadership, group action and social competence. Participation in student government is also encouraged. Many opportunities exist for participation in student affairs through election to student body and class offices, appointment to student committees, and attendance at meetings of the Student Senate. Students are also offered an opportunity to serve on many faculty committees and on the boards of the Fresno State College Association, Inc. These groups play an active part in recommending college policies and in conducting the affairs of the Association.

SHOTGUN SLADE

STUDENT CONDUCT

Students are expected to observe college regulations and are held responsible for their personal behavior on the campus and in college-related activities. Sections 41301–41304 in Article 1, Subchapter 3, Chapter 1, Part V of *Title 5* of the *California Administrative Code* and Section 22505 of the *California Education Code* delineate the types of conduct that are unacceptable to the college. In addition, local rules and policies have been developed to cover certain situations such as the residence halls. University, Trustee, and State regulations governing student conduct are described in the *Guide to Campus Rules and Regulations,* the *Handbook for Student Organizations,* and the *Student Rights and Responsibilities Manual.* A copy of the Guide is made available to each student at registration. Copies of the other documents are available in the Dean of Student Affairs and the Student Activities Offices.

STUDENT ABSENCES

Students are expected to maintain regular attendance at classes. Extended absences (more than one week) due to illness, death in the immediate family, or other extraordinary emergencies, should be reported immediately to the Counseling Office which will notify the faculty concerned. When any absence occurs, however, the student should contact the instructors involved concerning the possibility of making up the work missed.

STUDENT HEALTH SERVICE

The objective of the Student Health Service is to keep the student in a state of optimum health, both physically and mentally, so that he may realize to the fullest the opportunities afforded by Fresno State. The health services are sponsored jointly by the college and the student body, the latter participating by means of a $2 health fee each semester.

The Student Health Service is housed in its own building, with four well-equipped doctors' suites, laboratory and X-ray facilities, nurses' treatment rooms, secretarial office, and waiting room. It is open each school day during hours posted at the entrance to the building. At these times registered nurses are on duty and physicians are available for consultation. Many medical specialties are represented among the part-time and full-time physicians, affording a high standard of medical care.

During hours when the offices are closed, a qualified student may secure the services of his own physician, in which case the Student Health Service will allow $5 toward the cost of one office visit or $10 toward the cost of one residence visit for any one illness. In addition, an excellent student sickness and accident insurance policy is offered through the Health Service.

LANGUAGE, HEARING, AND SPEECH CLINIC

The Language, Hearing, and Speech Clinic is part of the program of communicative disorders within the Communicative Disorders Department. Any regular student needing diagnostic or therapeutic assistance with language, hearing, or speech problems may arrange to secure the service of the clinic without charge.

FEES AND EXPENSES

Note: Fees are subject to change by the Trustees of the California State University and Colleges. Auditors pay the same fees as students registered for credit. See *Financial Aids—Waiver of Fees* for exceptions *to the fees listed below.*

Materials and service fee, per semester:	
1 to 3.9 units	$39.00
4 to 7.9 units	44.00
8 to 11.9 units	49.00
12 and more units	59.00
Student Body Association fee * (not a state fee):	
For each student enrolled for fewer than 8 units	5.00
For each student enrolled for 8 units or more	10.00
Student Body Center fee (not a state fee):	
For each student enrolled for fewer than 8 units	5.00
For each student enrolled for 8 units or more	10.00
Facilities fee, all students	3.00
Health Service fee (not a state fee), optional	2.00
Nonresident ** tuition fee (foreign and domestic), per semester *in addition to other fees:*	
Each nonresident student enrolled for 15 units or more	555.00
Each nonresident student enrolled for fewer than 15 units, per unit or fraction	37.00
Foreign visa student tuition fee—same as nonresident.	
Extension, per unit:	
Lecture or discussion course	19.00
Activity course	24.75
Science laboratory course	38.00
Summer session courses, per unit	24.00
Other fees:	
Application for admission fee (nonrefundable)	$20.00
Diploma fee (not a state fee)	4.50
Transcript of record	1.00
Thesis binding fee (not a state fee), per copy (includes 25¢ sales tax)	5.25
Additional copies, per copy	4.75
Foreign visa student health insurance fee (not a state fee)	15.00
Credential fee *(collected for State Department of Education, each credential)*	20.00
Penalties:	
Check returned for any cause	$2.00
Late registration (in addition to materials and service fee)	5.00
Change of program after final filing date	1.00
Failure to meet administratively required appointment or time limit	2.00
Late filing of student programs	2.00
Late filing of application for degree or credential	2.00
Lost or broken items	cost or $1.00 if cost is less than $1.00.
Lost library items	replacement cost plus $3.35 service charge.
Damaged library items	50¢ up to replacement cost, plus $3.35 service charge
Residence Hall rates:	
Room and board, per semester each student	$464–645
(Includes room; up to nineteen (19) meals per week during the time college is in session; campus and local telephone service.)	

* In certain instances students may work on campus to earn back the amount of this fee. Application for the work must be made to the Financial Aids Office at least two weeks prior to scheduled registration dates.

** A nonresident student is any person who has not been a bona fide resident of the State of California for more than one year immediately preceding the last day a student may register without paying a late registration fee. The Fresno State attorney on residence matters has sole authority to make resident determinations.

Parking fees: decal (subject to change):

Fall and spring, per semester	$13.00
First summer session	5.00
Post session	4.00

REFUND OF FEES

Registration Fees

After a student makes a formal withdrawal from the college through the Student Records Office, a refund of a portion of the *materials and service fee* may be made if a written application for refund is filed not later than fourteen calendar days after the first day of instruction. A student shall make the application personally; if in the opinion of the administration, he is unable to do so, the parents or guardian of the student who is a minor, or the duly authorized representative of the student who is of the age of majority may make the application. (See *California Administrative Code, Title 5, Section 41802*)

The amount of the refund will be determined by the Business Office by deducting the cost of materials and services used, plus $10 for registration costs. A full refund may be made to a student who is unable to continue a course, because of a college regulation or compulsory military service, at any time prior to the date he receives any academic credit for any course or courses for which he is registered. The *late registration fee* is not refundable. *There is no refund for a reduction in the student's unit load.*

The same withdrawal and application for refund procedure applies for the *nonresident tuition fee* except that the time limit is different. There may be a refund for reduction in unit load. Within the first week of the session, a full refund may be made for units dropped. For each additional week, the refund diminishes as follows: 90 percent of the fee, the second week; 70 percent the third week; 50 percent, the fourth week; 30 percent, the fifth week; 20 percent, the sixth week; no refund, after the sixth week.

Parking Fees

A student is entitled to a refund of parking fees in the amount shown in the following schedule if on any one calendar day within the applicable period he files with the Business Office a written application for refund and returns all documents issued to him by the college which evidence his right to use the parking facility including any parking permit, stickers, and decal so issued. If the decal is attached to a vehicle and the vehicle is presented to the college for removal of the attached item by or under the direction of the State, such presentation and removal shall constitute return of the attached item.

Beginning with the first day of instruction, 75 percent of the parking space fee is refunded if application is made as indicated above within 1–30 calendar days; 50 percent, within 31–60 calendar days; 25 percent, within 61–90 calendar days; no refund, 91 days to end of semester.

(For refund of fees during summer sessions consult the Business Office.)

Other Fees

The schedule of refunds for *the health service fee, the Student Body Association and Center fees, and the facilities fee* is set annually. Refunds are dependent upon the length of time between the opening of the semester and application for refund. Application must be made and the student body and student identification cards must be turned in to the Student Records Office.

ESTIMATE OF EXPENSES

The basic expenses for attendance at Fresno State College for a year (two semesters) for full-time students who live away from home will range from approximately $1,500 to $2,000. These figures are exclusive of nonresidence tuition fee, but include an estimate of such personal items as clothes, laundry, and incidental expenditures. Students who live at home or share apartments with other students and commute to the campus are able to reduce their expenses considerably below the estimated figure. The cost of board and room may also be reduced by cooperative living arrangements or part-time work in exchange for room and board.

Board and room	from $950–$1300
Materials and service fee	118
Association fee and health service fee	24
Health facilities fee	6
Student Body Association Center fee	20
Books and supplies	100 to 150

DEBTS OWED TO THE COLLEGE

From time to time the student may become indebted to the college. Debts occur, for example, when the student fails to repay money borrowed from the college or he fails to pay college dormitory or library fees or for other services provided by the college at his request. Should this occur, Sections 42380 and 42381 of *Title 5 of the California Administrative Code* authorize the college to withhold "permission to register, to use facilities for which a fee is authorized to be charged, to receive services, materials, food, or merchandise or any combination of the above from any person owing a debt" until the debt is paid. Under these provisions the college may withhold permission to register and may withhold other services such as grades and transcripts. If a student feels that he does not owe all or part of a particular fee or charge, he should contact the college business office. That office, or another office to which the student is referred, will review the pertinent information, including information the student may wish to present, and will advise the student of its conclusions with respect to the debt.

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ADMISSION TO THE UNIVERSITY

Requirements for admission to California State University, Fresno, are in accordance with *Title 5*, Chapter 5, Subchapter 2 of the *California Administrative Code* as amended by the Board of Trustees of the California State Colleges on November 24, 1970. A prospective applicant who is unsure of his status under these requirements is encouraged to consult a school or college counselor or the college admissions office.

Limitation of Enrollment

Applicants for admission are notified that, pursuant to Section 40650 of *Title 5* concerning limitation of enrollment, admission to Fresno State College does not guarantee admission to a major or to any courses required for that major. Although every effort will be made to notify students of majors which are at capacity, such notification cannot be guaranteed.

STATE APPLICATION PROCEDURE FOR 1973–1974

All prospective students must file a completed application for admission within the appropriate filing period. A completed undergraduate application includes Part A, the application form; Part B, the data form; and the nonrefundable application fee of $20.00. A graduate application includes Part A; Part B; Part C, the supplemental graduate admission application; and the nonrefundable application fee of $20.00. Graduate applicants who were enrolled as undergraduate students at the college in the term immediately preceding the term for which they now wish to apply must also complete all the required forms and submit the $20 application fee. Each applicant may file only one application for any one term within the California State University and College system. The application should be filed with the college of first choice. Alternate choice campuses may be listed on the application.

Application Filing Periods for 1973–74

Term	Initial Filing Period	Extended Filing Period Begins (continues until quotas are reached)
Summer 1973	Jan 2–31, 1973	Feb 2, 1973
Fall Q 1973	Nov 1–30, 1972	Dec 1, 1972
Fall S 1973	Nov 1–30, 1972	Dec 1, 1972
Winter Q 1974	June 1–30, 1973	July 1, 1973
Spring S 1974	Aug 1–31, 1973	Sept 1, 1973
Spring Q 1974	Aug 1–31, 1973	Sept 1, 1973

Semester Calendar

Chico
Fresno
Fullerton
Long Beach
Sacramento
San Diego
San Fernando
San Francisco
San Jose
Sonoma

Quarter Calendar

Bakersfield
Dominguez
Hayward
Humboldt
Los Angeles
Cal Poly, Kellogg-Voorhis
San Bernardino
Cal Poly, San Luis Obispo
Stanislaus

Initial Filing Period

All applications received during the initial filing period will receive equal consideration within the colleges' established enrollment categories and quotas, regardless of the time and date they are received.

Space Reservations

Applicants who can be accommodated within category 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. After the student receives notice of the space reservation, 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 REQUEST THAT TRANSCRIPTS BE SENT UNTIL REQUESTED TO DO SO BY THE COLLEGE WHERE SPACE HAS BEEN RESERVED.

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REDIRECTION

Applications of students who cannot be accommodated at their first choice college will automatically be forwarded to their second choice; if they cannot be accommodated there, to their third choice, and so on. An applicant may wish to have his application redirected to another California State University or College after space has been reserved at Fresno State. Prior to an admission decision, the application and any supporting documents will, at the applicant's request, be forwarded to any state university or college where space is still available. No additional application fee is required.

Hardship Petitions

Each university or college has established procedures to consider qualified applicants who would be faced with an extreme hardship if not admitted. Prospective hardship petitioners should contact the concerned institution regarding specific policies governing hardship admission.

Extended Filing Period

Universities and colleges not filling enrollment categories during the initial filing period will continue to accept applications during the late period until quotas are filled. Enrollment priorities within the last period will be granted in chronological order of application receipt by the institutions.

UNDERGRADUATE ADMISSION REQUIREMENTS

FIRST-TIME FRESHMEN

Applicants who have had no college work after high school graduation will be considered for admission as first-time freshmen under one of the following provisions. Results of either the CEEB Scholastic Aptitude Test (SAT) or the American College Testing program examination (ACT) are acceptable in establishing eligibility. Registration forms for either test may be obtained from high school and community college counselors, State University and College testing offices or directly from the testing service at the address below.

SAT: CEEB, Box 1025, Berkeley, California 94770

Dates Test Given

Oct 14, 1972 (SAT only, Cal-Tex)
Nov 4, 1972 (SAT only)
Dec 2, 1972 (SAT and ACT)
Jan 13, 1973 (SAT and ACT)
Mar 3, 1973 (SAT and ACT)
Apr 7, 1973 (SAT only)
May 5, 1973 (ACT only)
July 14, 1973 (SAT and ACT)

ACT: Registration Unit, P.O. Box 168, Iowa City, Iowa 52240.

Dates Test Given

Oct 21, 1972
Dec 9, 1972
Feb 24, 1973
Apr 28, 1973
July 21, 1973

Exceptions: College credit earned concurrent with high school enrollment; college credit earned in summer session after high school and prior to regular matriculation in college; college credit granted for the CLEP or ADVANCED PLACEMENT programs, or military or USAFI courses; or college credit granted for some nontraditional learning experience will *not* affect the applicant's status as a first-time freshman for application quota purposes as well as admission. Further, the accelerated student who completes his high school program midyear, who has applied to the California State University and Colleges for the following fall term, but chooses to attend a local community college in the spring term will be considered a first-time freshman for application quota purposes as well as admission. All such college or advanced standing credit, if fully acceptable as transfer credit, will be granted the student after admission.

California High School Graduates and Legal Residents for Tuition Purposes: Applicants must have a grade-point average and total score on the SAT, or composite score on the ACT, which together provide an eligibility index placing them in the upper one-third of California high school graduates. The grade-point average is based upon all high school course work completed in grades 10–12, excluding physical education and military science.

High School Graduates from Other States or Possessions Who Are Nonresidents for Tuition Purposes: Applicants must present an eligibility index which places them in the upper one-sixth of California high school graduates. See *Eligibility Index.*

Graduates of High Schools in a Foreign Country: An applicant who is a graduate of a

foreign high school must have preparation equivalent to that required of eligible California high school graduates. The college will carefully review the previous record of all such applicants and only those with promise of academic success equivalent to that of eligible California high school graduates will be admitted. Such applicants may be required to take the Test of English as a Foreign Language (TOEFL) or SAT and other tests deemed appropriate by the college.

Non-High School Graduates: An applicant who is over 21 years of age, but has not graduated from high school will be considered for admission only when his preparation in all other ways is such that the college believes his promise of academic success is equivalent to that of eligible California high school graduates.

High School Students: A limited number of students of exceptional ability who are enrolled in high school will be considered for admission to certain special programs if recommended by the principal and their preparation is equivalent to that required of eligible California high school graduates. Eligibility for admission is determined by the Admissions Office and is only for a given program. It does not constitute the right to continued enrollment.

ELIGIBILITY INDEX

The following chart is used in determining the eligibility of graduates of California high schools (or California legal residents) for freshman admission to a state university or college. Grade-point averages are based on work completed in the last three years of high school, exclusive of physical education and military science. Scores shown are the SAT total and the ACT composite. Students with a given GPA must present the corresponding test score. Conversely, students with a given ACT or SAT score must present the corresponding GPA in order to be eligible.

The minimum eligibility index is SAT, 3072 and ACT, 741. The index is computed either by multiplying the grade-point average by 800 and adding it to the total SAT score, or multiplying the grade-point average by 200 an adding it to 10 times the composite ACT score.

G.P.A.	A.C.T. Score	S.A.T. Score
(.....)[1]		
3.20	11	512
3.19	11	520
3.18	11	528
3.17	11	536
3.16	11	544
3.15	12	552
3.14	12	560
3.13	12	568
3.12	12	576
3.11	12	584
3.10	13	592
3.09	13	600
3.08	13	608
3.07	13	616
3.06	13	624
3.05	14	632
3.04	14	640
3.03	14	648
3.02	14	656
3.01	14	664
3.00	15	672
2.99	15	680
2.98	15	688
2.97	15	696
2.96	15	704
2.95	16	712
2.94	16	720
2.93	16	728
2.92	16	736
2.91	16	744
2.90	17	752
2.89	17	760
2.88	17	768
2.87	17	776
2.86	17	784
2.85	18	792
2.84	18	800
2.83	18	808
2.82	18	816
2.81	18	824
2.80	19	832
2.79	19	840
2.78	19	848
2.77	19	856
2.76	19	864
2.75	20	872
2.74	20	880
2.73	20	888
2.72	20	896
2.71	20	904
2.70	21	912
2.69	21	920
2.68	21	928
2.67	21	936
2.66	21	944
2.65	22	952
2.64	22	960
2.63	22	968
2.62	22	976
2.61	22	984
2.60	23	992
2.59	23	1000
2.58	23	1008
2.57	23	1016
2.56	23	1024
2.55	24	1032
2.54	24	1040
2.53	24	1048
2.52	24	1056
2.51	24	1064
2.50	25	1072
2.49	25	1080
2.48	25	1088
2.47	25	1096
2.46	25	1104
2.45	26	1112
2.44	26	1120
2.43	26	1128
2.42	26	1136
2.41	26	1144
2.40	27	1152
2.39	27	1160
2.38	27	1168
2.37	27	1176
2.36	27	1184
2.35	28	1192
2.34	28	1200
2.33	28	1208
2.32	28	1216
2.31	28	1224
2.30	29	1232
2.29	29	1240
2.28	29	1248
2.27	29	1256
2.26	29	1264
2.25	30	1272
2.24	30	1280
2.23	30	1288
2.22	30	1296
2.21	30	1304
2.20	31	1312
2.19	31	1320
2.18	31	1328
2.17	31	1336
2.16	31	1344
2.15	32	1352
2.14	32	1360
2.13	32	1368
2.12	32	1376
2.11	32	1384
2.10	33	1392
2.09	33	1400
2.08	33	1408
2.07	33	1416
2.06	33	1424
2.05	34	1432
2.04	34	1440
2.03	34	1448
2.02	34	1456
2.01	34	1464
2.00	35	1472
(.....)[2]		

[1] Students earning grade point averages above 3.20 are eligible for admission.
[2] Students earning grade point averages below 2.0 are not eligible for admission.

ADMISSION OF UNDERGRADUATE TRANSFER STUDENTS

Applicants for admission to the California State University and Colleges as undergraduate transfers will be considered for admission under one of the following provisions.

Applicants who have successfully completed 60 or more transferable semester units or the equivalent are eligible for admission if they have achieved a grade-point average of 2.0 (C) and were in good standing at the last college attended. Nonresident applicants must have earned a grade-point average of at least 2.4 (C plus). Submission of SAT or ACT scores is encouraged, but not required.

Applicants who have successfully completed fewer than 60 transferable semester units or the equivalent are eligible for admission if they meet the above requirements *and* the current first-time freshman requirements. Applicants for admission as transfer students who have been continuously enrolled at a college since graduation from high school are eligible if they meet the first-time freshman requirements in effect at the time of their high school graduation. Either SAT or ACT test results are required of transfer applicants with fewer than 60 transferable semester units.

An applicant with a particular major who does not meet either of the above provisions may be admitted to the college for the purpose of pursuing a major for which appropriate course work is not offered at the college from which he seeks to transfer when he meets all of the following:

1. He has completed all appropriate course work offered.
2. He has attained a grade-point average of 2.0 (C) in all college work attempted.
3. He was in good standing at the last college attended.
4. He can, in the judgment of Fresno State, succeed in that degree objective.

ADMISSION AS AN INTERNATIONAL (FOREIGN) STUDENT

At Fresno State individual admission decisions are made on the basis of complete academic records from all secondary and college level schools, demonstrated English proficiency by performance on the Test of English as a Foreign Language (TOEFL), and certified financial support.

OTHER APPLICANTS

Applicants not admissible under one of the above provisions should enroll in a junior college or other appropriate institution. Only under the most unusual circumstances will such applicants be permitted to enroll in the college. Permission is granted only by special action.

GRADUATE ADMISSION

See *School of Graduate Studies*

FRESNO STATE APPLICATION PROCEDURE

Applications are accepted under provisions of the California State University and Colleges common admissions program. Applications for a fall semester should be filed during the preceding November. Applications for a spring semester should be filed during the preceding August. Applications will be accepted after the one-month open filing period if space is available. *Prompt submission of applications is important.* See *Application Procedure for 1973–1974.*

For undergraduate admission to Fresno State a student must:

1. Submit a current application with the nonrefundable $20.00 application fee to the Admissions Office.
2. Upon receipt of a space reservation, request institutions formerly attended to forward directly to the Admissions Office transcripts of credits from high school and colleges. College transcripts are required in duplicate. Failure to include all colleges attended may result in cancellation of the student's registration. All transcripts submitted by matriculated students are retained by Fresno State.
3. Take the SAT or ACT and request official scores be sent to Fresno State, if lower division.
4. Take any additional entrance examinations required.

A veteran should, in addition, file a photostatic copy of his *Notice of Separation* (DD 214)

from the armed services with the Office of Admissions. He will be allowed credit for service time and service schools completed as recommended by *A Guide to the Evaluation of Educational Experiences in the Armed Services.* He may also be given selection preference under conditions outlined on the application form.

Applications will not be accepted after admissions categories have closed. Eligibility for admission cannot be determined until *all* required documents have been received. Due to staff limitations, an evaluation of transfer credit will generally not be available until at least a month after admission.

Degree credit may be granted for work completed satisfactorily in another accredited institution of collegiate grade subject to the restrictions imposed on work taken at this institution. Questions concerning acceptability of a course from another institution should be addressed to the Evaluations Office.

A maximum of 70 semester units is allowed toward the bachelor's degree for work completed in a community college and no upper division credit is given; however, community college credit in excess of 70 units may be used to satisfy subject requirements.

For limitations on extension and correspondence credit, see *Extension Classes.*

Students interested in college housing or financial aid should file special applications with the offices concerned as soon as possible.

For admission to graduate study, see *School of Graduate Studies.*

ENTRANCE EXAMINATIONS

All entering undergraduate students with fewer than sixty (60) units of credit accepted by Fresno State are required to submit scores from the College Entrance Examination Board *Scholastic Aptitude Test* (SAT) or the American College Testing Program battery (ACT). The only exceptions to this requirement are foreign students from non-English speaking countries. Students transferring to Fresno State who have more than sixty (60) units accepted by the college and who have scores on either of these tests should report them to the Admissions Office.

The Educational Testing Service and the American College Testing Program have established testing centers throughout the country where students may take these tests. Information about the tests and registration materials may be obtained from local high schools, colleges, and the Test Office at Fresno State. Registration fees are as follows: SAT, $6.50; ACT, $6.00.

In order to allow time for the college to receive the test scores, students should arrange to take the test at least two months before entering the college. See *State Admission Procedures* and *Eligibility Index.*

English Proficiency Test for Foreign Students: The college requires that students whose native language is not English take the *Test of English as a Foreign Language (TOEFL),* administered by the Educational Testing Service at testing centers throughout the world. An exception may be made for transfer students from American colleges whose grades demonstrate full competency in English. TOEFL is an objective examination designed to indicate whether the foreign student's comprehension of and ability to use the English language is adequate for college work. Information on testing dates and cities where the test is given may be obtained by writing to Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey 08540, USA. Students should arrange to take the test at least six months before enrolling in college in order to allow time for receipt and evaluation of test scores.

Speech Test: A speech proficiency test is required of transfer students who are candidates for teaching credentials. Students who fall below the proficiency level required of teachers will be expected to take Communicative Disorders 76, Problems in Oral Expression. See *School of Education—Admission to Credential Programs.*

Medical Examination: Upon acceptance by the college, a health history and physical examination form will be mailed to all new students by the Admissions Office. The health history should be completed by the student and the physical examination performed by a private physician. This form should be mailed to the Student Health Service at least two weeks prior to registration. The completion of the physical examination is a requirement for registration at Fresno State. Candidates for teaching credentials must secure approval of the Health Service at both the time of application for admission to credential programs and upon assignment to directed teaching. A credential may not be issued unless the candidate possesses satisfactory physical and mental health to meet fully the responsibilities of teaching.

PROFICIENCY TESTS

Proficiency tests are required by some departments prior to admission and programming students in certain courses or curricula in business, chemistry, engineering, foreign language, mathematics, music, physical education, physics, and teacher education. Some of the tests are administered by the Testing Center; others, by the departments concerned. Further information may be obtained from department advisers.

RESIDENCE QUESTIONNAIRE

Each applicant must complete the residency questions which are part of the application for admission before his eligibility for admission can be determined. Students in continuous attendance during successive semesters are required to file residence questionnaires only if their residency status changes. After initial filing a break in attendance requires a new application and residency statement.

Summer session and extension students are not required to file statements of residence.

Determination of Residence

The following statement of the rules regarding residency determination is not a complete discussion of the law, but a summary of the principal rules and their exceptions. The statutes governing residence determination for tuition purposes are found in *Education Code* Sections 23753.2–23762, *Government Code* Sections 243–244, and *Civil Code* Section 25. The determination of whether a student qualifies as a "resident" for admission and tuition purposes is made by the college after review of a Residence Questionnaire completed by each student upon entering the college. The residence questionnaire is designed to provide to the college information necessary for residency determination, including the applicability of any exceptions.

The general rule is that a student must have been a California resident for at least one year immediately preceding the residence determination date in order to qualify as a "resident student" for admission and tuition purposes. A residence determination date is set for each academic term and is the date from which residence is determined for that term.

Whether a student has acquired California residence usually depends on whether he has attained majority; i.e., has become an adult. Majority is attained at 18 years of age. If the student is a minor, residence is derived from (and therefore is the same as) that of his or her father. If the father is not living, the student's residence is that of the mother while she remains unmarried. A minor cannot change his residence by either his own act or that of his guardian.

Upon attaining majority, the student may acquire a residence apart from his parents. The acquisition of California residence by an adult requires both physical presence in the state and, at the same time, an intent to remain in California indefinitely, an intent to regard California as one's permanent home. Although physical presence is easily proven, subjective intent is more difficult, requiring the student to present evidence of various objective manifestations of such intent. The foregoing rules will have a special application during the 1972–73 academic year with respect to persons who attain their majority as a result of the recent legislative change reducing the age of majority from 21 to 18.

The residence of a married woman is that of her husband unless she is separated, in which case she can establish her own residence. An alien is not eligible to acquire residence until admitted into the United States for permanent residence under an immigrant visa.

Since the general rules of residence determination, summarized above, work hardships in some cases, the Legislature has provided a number of exceptions which, in effect, waive nonresident tuition. These rules are limited in scope, and are quite detailed. If it appears that any of them may be applicable, the student may wish to discuss the matter with the residence clerk of the college.

Exceptions are provided for:

1. Minors living under the direct care and control of a California resident for periods of time which are specified in the law.
2. Minors whose parents were California residents but who have left the state. (Depending on the length of the parents' residence in California, the minor is given a "grace period" during which he is considered a California resident even though his parents have become residents of another state.)
3. Minors who have a parent in active military service and stationed in California on the

residence determination date; California resident minors who have a parent in active military service but stationed outside the United States on the residence determination date, and California resident spouses of such servicemen.

4. Persons who have attained their majority by the residence determination date, and who were entirely self-supporting and present in California for the entire preceding year.
5. Women who are California residents and who marry nonresidents provided residence is not established in any other state.
6. Children of deceased public law enforcement or fire suppression employees, who were California residents, and who were killed in the course of law enforcement or fire suppression duties.
7. Full-time state university and college employees and their children and spouses.
8. Certain credentialed, full-time employees of school districts.
9. Certain exchange students.

The student is cautioned that this summation of rules regarding residency determination is by no means a complete explanation of their meaning. He should also note that changes may have been made by the Legislature between the time this catalog is published and the relevant residence determination date.

PROGRAM PLANNING AND REGISTRATION

Freshman students should plan their programs as early as possible beginning, when practical, with the selection of a major. Degree requirements in each major are listed under the appropriate department. For general information see *Degrees and Credentials.*

Students will be assisted in planning their programs by academic advisers, but the primary responsibility for meeting requirements is theirs. The current *Schedule of Courses* must be followed when planning a particular semester's program.

Recommended Preparation

Overall excellence of performance in high school subjects and evidence of academic potential provide the basis for admission at Fresno State. While no course pattern is required, the applicant to be properly prepared to undertake a full program of studies and particularly to pursue the required program in general education, is strongly encouraged to include the following subjects as minimal.

College preparatory English.
Foreign language.
College preparatory mathematics.
College preparatory laboratory science.
College preparatory history and/or social science.
Study in speech, music, art, and other subjects contributing to general academic background.

Since certain fields of study require high school preparation in definite subjects, the student should consult the requirements indicated in the field of his choice.

In college fields such as engineering, natural science, mathematics, social science, and humanities a maximum number of high school credits should be obtained in appropriate subjects in English, mathematics, science, and foreign languages.

TRANSFER STUDENTS

Students intending to transfer to Fresno State should plan their programs while attending other colleges to meet curriculum requirements of this college. The general degree regulations and the requirements in the department offering the major selected should be studied for courses and sequences necessary for the degree.

Students transferring from a California community college should complete the general education requirements of that college for state university and college transfers and request that their general education program be certified to Fresno State.

After admission to Fresno State, the student will receive a copy of his advanced standing evaluation indicating how previous college credits have been applied toward requirements at Fresno State.

Each student should develop a personal folder in which he keeps his own copies of transcripts, grade cards, advanced standing evaluation, departmental check sheets, and other information pertaining to his progress toward meeting various requirements for his degree or credential. Advisers are available for assistance; it is the responsibility of the student, however, to be sure that he has met all requirements.

REGISTRATION

Registration is open to new students who have been formally admitted and to continuing students in good standing. Former students returning after an absence of one semester or more must apply for admission, subject to college enrollment limitations and filing deadlines. Students who are returning after an absence of two semesters or more and those who have been absent one semester or more and have attended another institution in the interval will be required to pay the $20 application fee when applying. The *Academic Calendar* lists dates of registration. Late registrants are assessed a fine of $5 and a late filing fee of $2 if materials are not filed within 48 hours. *Registration is complete only when all required forms are completed and filed and all fees are paid.* See *Academic Calendar* for all deadline dates.

SCHEDULE OF COURSES

An official *Schedule of Courses* is prepared for publication each semester listing registration procedures, courses offered, hours and rooms and important deadlines. The schedule is available prior to registration and may be purchased through the ticket office of the Little Theatre for a nominal cost.

CONCURRENT REGISTRATION AT ANOTHER COLLEGE

Approval of the Registrar must be obtained in advance of registration before transfer credit may be earned at another college concurrently with registration at Fresno State College. Normally permission for concurrent registration will not be granted for a class which is offered at Fresno State College.

PROGRAM RESTRICTIONS

Students are cautioned against registering for more than 17 units without consulting an adviser, since more than 17 units constitute an academic overload. See *Schedule of Courses.*

Enrollment in upper division courses is restricted to students with junior, senior or graduate standing, or who have the necessary prerequisites. Exceptions are subject to the approval of the instructor and department chairman. Upper division credit may not be granted until students have completed a minimum of 45 semester units. Only students who have been fully approved for admission to credential programs may enroll in certain education courses and qualify for a school service credential on the basis of the college's recommendation.

Credit in any course is also subject to all restrictions which may appear in the *General Catalog.* For restrictions on graduate study, see *School of Graduate Studies—Master's Degrees.*

CHANGE OF MAJOR

Each undergraduate student who wishes to change his major should report to the Counseling Center to initiate the procedure; graduate students should report to the Graduate Office. The Counseling Center will notify the department concerned so that advisement records may be forwarded to the new department and a new adviser assigned.

WITHDRAWAL FROM COURSES

A student is held responsible for the program of courses in which he is officially registered. After the second week of instruction no changes will be made or recorded until forms provided by the Student Records Office have been completed and filed in that office. Withdrawal forms require the signature of the instructor. No courses may be added after the second week of instruction. (See current *Schedule of Courses.)* A student is urged to consult his adviser before making a program change. If the application is filed before the end of the fourth week of classes, the course will not be recorded on the permanent record. The end of the fourth week is defined as the end of the twentieth instructional day of the semester. If the student withdraws after the fourth week, but prior to the last ten instructional days, either a WP (withdrawal passing) or a WF (withdrawal failing) will be recorded, depending upon whether he is passing or failing the course at the time of withdrawal. No program changes other than complete withdrawal from the entire enrolled program (withdrawal from college) may be made during the last ten instructional days or thereafter. See *Refund of Fees.*

WITHDRAWAL FROM COLLEGE

A student withdrawing from college at any time after registration must file written application on the forms obtained from the Student Counseling Center. An application filed before the end of the fourth week of the semester will enable the student to withdraw without having classes recorded. The end of the fourth week is defined as the end of the twentieth instructional day of the semester. If the application is filed after that time, either a WP (withdrawal passing) or a WF (withdrawal failing) will be recorded, depending upon whether the student is passing or failing the course at the time of withdrawal.

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PREPROFESSIONAL PREPARATION

Preprofessional programs are available for students who plan to transfer to another institution for the completion of professional curricula in such fields as dentistry, forestry, law, librarianship, medicine, optometry, occupational therapy, pharmacy, theology, and veterinary medicine. Certain of these programs are described below. Students planning to complete a preprofessional program and degree at Fresno State must complete a major offered at this college. They should include their preprofessional area plus their Fresno State major on all registration forms; for example, premedical-chemistry, premedical-biology, prelaw-history, prelaw-political science. They should consult an adviser and the catalog of the school of their choice.

PREDENTAL

The minimum training for dentistry is a six-year course—the first two years (predental training) in a liberal arts college and the remaining four years (dental training) at a school of dentistry.

The minimum predental program required by accredited dental schools is one year each of English, inorganic chemistry, physics, and zoology; one semester of organic chemistry; and additional courses (usually elective in general education, but specified by some dental schools) for a total of 60 units. Each science course must include laboratory. The present trend among dental schools is to require more than two years of predental training including a broad liberal arts background. Since 1971, three years have been required by the University of California, San Francisco, and some other dental schools. Additional organic chemistry, quantitative chemical analysis, elementary physical chemistry, other zoology courses, and in some cases a foreign language are recommended or required. Several schools require a bachelor's degree for entrance. The American Dental Association aptitude test and evidence of physical fitness and good moral character are usually required. Many dental schools also require a personal interview and some administer additional tests. For other information, see the predental adviser and dental school catalogs.

PRELEGAL

Most fully accredited law schools require a bachelor's degree for admission. Since a prelegal program providing a broad cultural background is recommended by the law schools, any baccalaureate major, depending on the student's interest, may be chosen from the college offerings (See *Degree Majors and Minors*). Law schools suggest courses, but not necessarily a major, in the following: written and oral English, American and English constitutional history, world history, accounting, elementary logic, mathematics, economics, political science, philosophy, science, and foreign language. For further information consult an adviser and law school catalogs.

PRELIBRARIANSHIP

Accredited graduate schools of librarianship require a bachelor's degree for admission. A major in any subject is acceptable. A reading knowledge of at least one modern foreign language is a requirement for admission to most graduate schools of librarianship; this requirement is normally satisfied by the successful completion of two college years of the language. Students considering librarianship as a career should consult the prelibrary program adviser in the Library.

PREMEDICAL

A student interested in preparing for medical school may begin by declaring his intent at the time he applies for admission to Fresno State. To do this, it is necessary that he use a term such as premedical-sociology, premedical-zoology, premedical-chemistry or premedical-general on all application, admittance and registration papers. In case premedical-general is chosen, a specific subject major should be selected as soon as possible and not later than the sophomore year from the list of approved CSUF majors in the catalog. This part of the premedical program also constitutes the major that is required for a bachelor's degree. (See *Degree Programs, Majors, and Minors.*) Each premedical student will be assigned to a member of the premedical advisory committee who will assist him in planning his program of courses and will advise him concerning preparatory procedures for application to medical school.

Requirements for admission to medical school vary considerably from one medical school to another and change from time to time, but a well-balanced liberal education is usually specified. Some aptitude and college training in science and English are essential in medicine. The minimum requirements in these subjects specified by most medical schools can be satisfied by the following: biology, 13 units; chemistry, 19 units; physics, 8 units; and English, 6 units. Calculus is now required by some medical schools and a reading knowledge of a modern foreign language is required by a few. Because of competition for admission to medical schools, a minimum grade average of B– (2.7 grade points) is highly desirable.

Freshman, transfer, and all other students who are entering the program are advised to attend the premedical student orientation meeting scheduled prior to registration. (See the new-student orientation calendars.)

PREPHARMACY

The first two years (prepharmacy) of a six-year pharmacy program may be completed at Fresno State. Most professional schools require a C average or better for a minimum of 60 semester units, including one year each of inorganic chemistry, physics, calculus, zoology, and either English or speech; one semester of organic chemistry or quantitative analysis; and additional elective courses which are specified in certain areas by some schools. Students may elect to complete more than 60 semester units before applying to pharmacy school. A personal interview may be required of applicants by some schools. For other information see pharmacy school catalogs and consult the prepharmacy adviser in the Department of Biology.

PRETHEOLOGY

Students planning to attend a theological seminary or school may satisfy the undergraduate requirements at Fresno State College. Seminaries or schools which are members of The American Association of Theological Schools suggest that a pretheological student complete the following courses: English (literature, composition, speech), 6 units; philosophy, 3 units; natural sciences, 2 units; social sciences, 6 units; foreign language, 4 units in Latin, Greek, Hebrew, German, or French; religion, 3 units. The religion requirement may be satisfied at Fresno State College by appropriate sections of Phil 20T, 115T, 130T, 175T, Psych 170T, and by Soc 159. Additional courses are advised for students interested in religious education (see *Special Programs—Religious Studies*). The pretheological student is free to choose whatever major he desires. Pretheology faculty advisers will assist in course programming. For further information consult theological school catalogs.

PREVETERINARY

Students planning to attend a school of veterinary medicine may satisfy the first two years of the program at Fresno State College. Recommended courses are Agri 10, A Sci 10, 11, 70, Biol 120, Bot 10, Chem 1A-B, 8, 104, 105, 109, Phys 2A-B, Zool 1, 103, 160. The School of Agricultural Sciences is equipped to provide valuable experience with large animals through the student project program. Students desiring further information regarding the preveterinary curriculum should consult the Chairman of the Animal Science Department.

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ACADEMIC PLACEMENT

CLASSIFICATION OF STUDENTS

Student class levels are determined as follows:

Freshmen—Students who have earned a total of fewer than 30 semester units.
Sophomores—Students who have earned a total of 30 to 59 semester units inclusive.
Juniors—Students who have earned a total of 60 to 89 semester units inclusive.
Seniors—Students who have earned 90 semester units or more.
Graduates—Students who have at least a bachelor's degree from an accredited institution.

ADVANCED PLACEMENT

The Advanced Placement Program of the College Entrance Examination Board permits able high school students to take college-equivalent courses in the senior year of high school and, based upon comprehensive qualifying examinations, receive advanced placement and credit at participating universities and colleges. Fresno State grants credit toward its undergraduate degrees for successful completion of examinations of the Advanced Placement Program of the College Entrance Examination Board. Students who present scores of three or better will be granted six semester units of college credit for each examination. A score of "2" may receive similar credit, subject to the approval of the department. A score of "1" will receive neither credit nor advanced placement.

CREDIT BY EXAMINATION

Credit by examination is designed to encourage a regularly enrolled student to seek college credit in courses in which he has competence but for which he has not earned units by the usual academic processes, thereby permitting him to accelerate his progress and provide an opportunity for wider selection of course work. The following procedures should be followed:

1. A student may qualify for credit by examination in any course in the current CSUF catalog for which he appears to be reasonably qualified by training or experience and for which he has not been allowed previous high school or college credit. Credit by examination will not be allowed in a course in which the student has been permitted to register as an auditor during the same semester, in which he has received a failing grade, or in which he has unsuccessfully sought credit by examination.
2. The student will enroll for credit by examination at any time during the registration period. He must be regularly enrolled in other courses before he will be granted permission to earn credit by examination. Units of credit by examination are counted as part of the total units registered for a given semester or term. Normally the student will have conferred with the department and will have completed his application form in advance of registration.
3. The examination must be completed by the end of the fourth week of instruction and the instructor will report the grade prior to the close of the sixth week.
4. The course in which the student requests credit by examination will be so designated on his record. Units earned will count toward all appropriate requirements but will not be used in computing his grade-point average; a maximum of 30 units earned by examination may be counted toward a bachelor's degree.

For further information consult the department concerned. See also *Advanced Placement.*

COLLEGE LEVEL EXAMINATION PROGRAM

The College Level Examination Program (CLEP) is designed to be a means through which recognition, academic credit, and advanced placement may be given for less conventional forms of educational experience. Those who may have reached a college level of education in certain areas through home or correspondence study, on-the-job training, television courses or other means may take the CLEP examinations which are offered by the CEEB.

The CLEP examinations are of two types and credit will be granted as follows:

1. **General Examinations:** For each General Examination passed with a minimum scaled score of 500, six units of credit applied to the appropriate general education area except for the English Composition general examination for which three units will be granted.

2. **Subject Examinations:** For each Subject Examination passed with a minimum scaled score of 50, three to six units of credit depending upon the course equivalency assigned by the appropriate department.

INDEPENDENT STUDY

Independent study is offered to give the student experience in planning and outlining a course of study on his own initiative under departmental supervision. Independent study should deal either with a special interest not covered in a regular course or with the exploration in much greater depth of a subject presented in a regular course. Each department has an independent study upper division 190 course, and some departments have a graduate level 290 course. In some departments a 190 or 290 course may be desirable preparation for the thesis or other advanced study.

To be eligible for independent study, a student should have an over-all grade-point average of 3.0 or higher; this requirement may be waived in exceptional cases, when appproved by the chairman of the department concerned. Maximum credit of six units is allowed toward the bachelor's degree in 190 courses, and maximum credit of six units is allowed in 190 and 290 courses toward the master's degree.

An eligible student desiring to register for a 190 or a 290 course must first obtain the consent of an instructor who will guide the project and the chairman of the department in which the course is given, then register in the same manner as for any other course at the time of registration.

An independent study course normally includes an oral examination by a committee set up by the supervising instructor, a formal report which is filed in the department office, and an abstract of the study which is filed with the department chairman. Approval forms and copies of the current regulations may be obtained at department or school offices. The entry on the permanent record will show the discipline and course number only; the title will not appear.

Certain special regulations concerning enrollment in 190 and 290 courses during a summer session will be found in the *Summer Session Bulletin.*

FRESNO STATE

GRADES, SCHOLARSHIP, RECORDS

Units

A credit or semester unit represents one hour of class work per week for one semester. It is assumed that two hours of preparation are required for each hour in class. Three hours of laboratory per week are the equivalent of one unit. In a limited number of courses two hours of laboratory per week are the equivalent of one unit.

GRADES

A—Exceptionally good.
B—Above average.
C—Average.
D—Below average.
F—Failure.
INC—Semester requirements less than one-third incomplete, work of passing grade.
IP—Continuing work in progress, status satisfactory.
P—Passed without grade.
W—Withdrawal without grade.
WF—Withdrawal failing.
WP—Withdrawal passing.
AU—Audit.

Incomplete: An INC is given only when a student who has been doing passing work finds it impossible for justifiable reasons to complete the assignments of the last one-third (or less) of the course. If the course is taken in regular session, the student is obligated to make up the incomplete within the next semester in which he is registered, and the instructor, if he is on campus, is obligated to assist him in doing this. If the course in which the INC was received was taken in a summer session, the student is obligated to make up the incomplete not later than the next following summer. A student may be able to make up an incomplete without being enrolled; he should in every case confer with the instructor concerned. In the absence of the instructor who has assigned the grade of Incomplete, a student seeking to make up this grade should consult the department chairman. In no instance may the INC be made up later than one year after the end of the semester or session in which the grade was given. No student may be required to repeat a course in which he has received an INC unless he wishes to receive credit and the time for making up the grade has passed. An incomplete grade remains on the student's permanent record without penalty.

In Progress: The IP grade may be used only in courses designated on the approved IP grade course list published by the office of Academic Vice President. The IP remains on the transcript without penalty. Any subsequent completion of the course within the permitted time limit is shown by a later entry. Three semesters are permitted for completing a 299 course without reregistration; all other courses given IP grades operate under the same time limit as the INC.

Pass: The grade of P may occur in connection with any Pass-Withdraw enrollment (see Regulations and Procedures—Pass Withdraw Grading) and in certain other courses where all students are graded on this basis.

AUDIT STATUS

Persons wishing to attend classes without matriculating, meeting course requrements, or receiving college credit may register as auditors. Those registering as auditors must meet admissions deadlines and be cleared by the Admissions Office. Auditors must register during the late registration period in the usual way and pay the same fees as would be charged if the courses were taken for credit. Credit for courses audited will not subsequently be granted on the basis of the audit.

Matriculated students may audit courses in addition to those in which they are registered for credit. No students enrolled for credit in any class may transfer to audit status after the first four weeks of classes. Students enrolled in audit status only may not transfer to credit status without completing admission procedures; this must be done within the first two weeks. (See current *Schedule of Courses.*)

PASS-WITHDRAW GRADING

In order to encourage academic exploration by students and to discover whether some reduction in the pressure to secure grades can be achieved and is valuable, a "Pass-Withdraw" grading procedure has been in effect since the fall semester of 1967. The procedure is designed to limit the risks inherent in such an evaluation process, both to a student's grade-point average and to his prospect of normal advancement in his college program.

Under this plan a student may individually enroll in a course in which others are receiving grades on a five-point scale, but in which he may receive only the grades of "passed" (P) or "withdrawn" (W). The grade of P will be given if his work is judged to be equivalent to an A, B, or C grade as applicable to regular enrollment, or the grade of W if his work is equivalent to a D or F. Other conditions concerning P-W grading are as follows:

1. Not all courses will be available for this type of enrollment. In courses for which P-W grading is permitted, the student must inform the instructor of his desire for P-W grading. Further directions concerning enrollment procedure will also be found in the *Schedule of Courses.*
2. A student must be in good standing (not on probation).
3. A student may enroll in only one course in a semester or term on a P-W basis in addition to any enrollment in Experimental College and International Studies courses and those graduate courses in which P-W is the only authorized grade. A maximum of 12 units of such courses may apply to the total units required for the degree.
4. A course enrolled in on a P-W basis will not be taken into account in the computation of the grade-point average.

See current *Schedule of Courses* for further information.

GRADE POINTS

For each unit of credit the student receives grade points as follows:

A—Four grade points per unit of credit.
B—Three grade points per unit of credit.
C—Two grade points per unit of credit.
D—One grade point per unit of credit.
P—Units allowed but not counted in grade-point average.
INC, IP—Neither units nor grade points counted until final grade recorded.
F—Units counted, no grade points.
W—No units allowed.
WF—Units counted, no grade points.
WP—No units allowed.
AU—No units or grade points allowed.

The above grade point system became effective September 1, 1971, when the grades of WP and WF were added. A student may repeat any course in which a mark lower than C was received. Degree credit will be allowed only once for any course. A repeated course is counted as units attempted and is credited with the appropriate grade points earned by the repetition. Occasionally a student wishes to repeat a course in which he earns a C. Such repetition is recorded on the transcript but is not figured in unit or grade-point totals.

SCHOLARSHIP STATUS

SATISFACTORY SCHOLARSHIP

Effective September 1, 1965, uniform state-wide minimum standards for probation and disqualification were adopted pursuant to Section 41300 of *Title 5, Education,* of the *California Administrative Code.* All students, new, returning and continuing, will be held to these standards.

Satisfactory scholarship means at least a C average (2.0 grade-point average or twice as many grade points as units attempted). A student is considered in good standing if he is not on probation or disqualified. He should note that a C average in his major is a requirement for graduation. See *Degrees and Credentials—Scholarship requirements.*

PROBATION

A student will be placed on probation if either his grade-point average based on total units attempted at all colleges is below a 2.0 (C average) or his grade-point average based on all units attempted at Fresno State is below a C average. A student will be continued on probation until both his over-all and his Fresno State grade-point average are 2.0 or better, or until he is disqualified under one of the provisions of the disqualification regulations.

DISQUALIFICATION

A student will be disqualified under either of the following provisions: (a) if he is admitted on probation and fails to meet the conditions established at the time of his admission; (b) if he has a cumulative deficiency on either his overall or Fresno State record equal to or greater than that indicated below.

Freshmen, Sophomores (0-59 units completed):	15 grade-point deficiency
Juniors (60-89 units completed):	9 grade-point deficiency
Seniors (90 or more units completed):	6 grade-point deficiency
Graduates (all students):	6 grade-point deficiency on post-baccalaureate units

See also *School of Graduate Studies.*

READMISSION

A student disqualified from Fresno State may be readmitted for a regular semester only by special action and if the facts in the case seem in the opinion of the appropriate college authorities to warrant such action. A disqualified student may enroll for summer session or extension classes without readmission. Ordinarily consideration for readmission will not be given unless a semester has elapsed since the disqualification. Deadlines for consideration for readmission are established in advance for each semester; exceptions to these deadlines will not be made. Reconsideration for readmission will, except in very few cases, require that a student arrange a personal interview with a member of the admissions staff. A former stu dent who has obtained upper division status will normally be required to obtain a statement from the school or department of his major preceding an interview.

TRANSCRIPTS AND REPORTS

Transcript of Record. Students may request transcripts of their academic records at Fresno State with the payment in advance of a $1.00 fee. CSUF Extension transcripts must be requested separately. Because of the large number of transcripts requested at the end of each semester and summer session, three weeks should be allowed for requests to be filled during those periods. After the Records Office has been notified of overdue student accounts, transcripts will not be provided without clearance from the Business Office. Transcripts of record from other institutions submitted to this institution will not be returned to the student.

Reports to Students. An enrollment report is made available to the students by the Student Records Office and at the end of the semester final grade reports are mailed to the students at the address given at registration.

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DEGREES AND CREDENTIALS

Fresno State is authorized to grant the bachelor of arts, bachelor of science, bachelor of vocational education, master of arts, master of science, master of business administration, master of city and regional planning, and master of social work degrees. See *School of Education* for public school credentials for which the university is authorized to recommend candidates.

It is contrary to college policy to grant to a student two bachelor's degrees or to grant a second bachelor's degree after the student has earned a comparable degree from an accredited institution. A student may, however, complete the requirements for a second major and have this fact noted on his transcript.

GRADUATION AND COMMENCEMENT

The college holds one Commencement each year, at the end of the spring semester. Students who have completed the work for a degree in the previous summer or in the fall semester of that academic year are eligible to participate with those who complete their work in the spring semester. Students looking forward to meeting degree requirements should complete the following steps:

1. Obtain and file a completed application for a degree in the Evaluations Office at the beginning of the semester or summer session term during which requirements will be completed. See *Academic Calendar* for filing dates and deadlines; $2.00 fine for late filing. See also *Election of Regulations.* Failure to apply before the final deadline will delay the granting of the degree.
2. Request the Records Office to transfer any work completed or to be completed in Extension to the permanent record.

The Evaluations Office, considering his prior and current work, will check the student's application for a bachelor's degree against requirements and will report to the student regarding his eligibility for the degree. In the case of graduate degrees, this clearance is given by the Graduate Office.

In order to be eligible for graduation and participate in Commencement exercises, the student (1) must have been approved for graduation by the faculty, (2) must have met all financial obligations to the college, and (3) must have completed with appropriate scholastic standing all courses required for the degree. Graduates will receive their official diplomas by mail.

POST-BACCALAUREATE CREDIT

Upper division units earned at Fresno State in the semester or summer session in which the bachelor's degree is granted, provided they are not needed for such a degree and provided the student is in good academic standing at the beginning of the final semester and remains continuously in good academic standing, will be listed on the student's record as *post-baccalaureate credit.* A course in which a grade of "INC" or "IP" is received must be completed within two calendar weeks of the end of a semester or summer session in order that it may be counted toward the completion of degree requirements in that semester or session. Only credit for courses in which grades A, B, C, or P are earned may be counted. No course may have its credit divided between the baccalaureate and post-baccalaureate programs. Use of such credit for graduate degrees at Fresno State requires special approval (consult Office of the Dean, School of Graduate Studies). Use of such credit for other purposes is to be determined by the appropriate authority.

BACHELOR'S DEGREES

EVALUATIONS

Transfer students are provided with an advanced standing evaluation as part of the admissions process. Upon completion of approximately 90 semester units, each student should request a degree evaluation from the Evaluations Office which will show all requirements completed and any remaining degree requirements. Due to staff limitations only one degree evaluation can be made for each student. Each student should keep his personal copy current.

After evaluation, all transcripts become the property of the Records Office and are not returnable, even on loan. It is suggested that the student obtain duplicate copies of his record from his former schools for his personal file.

ELECTION OF REGULATIONS

A student by remaining in continuous attendance in regular sessions and continuing in the same curriculum in any state college, in any of the California community colleges or in any combination of California community and state colleges, may, for purposes of meeting graduation requirements, elect to meet the graduation requirements of the state college from which he will graduate in effect either at the time of his entering a curriculum or at the time of his graduation therefrom except that substitutions for discontinued courses may be authorized or required by the proper college authorities. The *General Catalog* lists the official graduation requirements for each year.

RESIDENCE REQUIREMENTS

For the bachelor of arts, bachelor of science, and bachelor of vocational education degrees a minimum of 24 semester units must be earned in residence at Fresno State; at least one-half of these units (12) must be completed among the last 20 semester units counted toward the degree. Summer session credit and credit earned in the California State University and Colleges International Programs may be applied on this requirement on a unit for unit basis.

For special residence requirements see *Public School Credentials* and *School of Graduate Studies.* For interpretation and definitions see *Admissions—Determination of Residence.*

Extension credit and credit by examination may not be used to fulfill the minimum residence requirement. (*California Administrative Code, Title 5, Chapter 5, Section 4043.*)

SCHOLARSHIP REQUIREMENTS

To qualify for any bachelor's degree a student must have at least a C average (2.0 on a four grade-point system) on his total college record, must have maintained at least a C average at Fresno State, and must have at least a C average in his approved major.

See also *School of Education—Application for Admission to Credential Programs, School of Graduate Studies,* and *Scholarship Status* from the preceding section of this catalog.

SPECIAL COURSE REQUIREMENTS

Entering undergraduate students should note the following specific requirements:

Physical Education Activities (PE M, C, SC, SM, SW, or W series). The college requires four semesters of physical education. Students are expected to take these activities during their first four semesters. The physical education requirement may be waived only on request for students who have a medical excuse from the college physician, or who are 25 years of age or older. A student seeking to deviate from meeting the requirement should consult the Counseling Center. Basic aerospace studies (4 semesters) may be substituted for the physical education requirement.

United States Constitution and American History. In accordance with *Title 5* of the *Administrative Code,* Section 40404, a student, in order to graduate, must demonstrate his competence with respect to the Constitution of the United States, American History, and in the principles of state and local government of California. This may be done by passing examinations or by completing appropriate courses. (See *History Department—American History Requirement* and *Political Science Department—United States Constitution Requirement.*)

FOREIGN LANGUAGE REQUIREMENT

Foreign language is not a general college requirement for admission to or graduation from Fresno State.

However, some schools and departments require the study of a foreign language as part of the preparation for specified undergraduate and graduate majors. In general, upper division and graduate courses in these fields require the use of foreign language. See school and department statements of majors for details and suggestions for appropriate languages.

Students following majors which require the study of a foreign language ordinarily meet the requirement in one of the following ways:

1. Students who have no foreign language credit from high school complete two years of satisfactory collegiate study in one foreign language.

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2. Students who have high school credit or other experience in a foreign language and who wish to continue in the same language are requested to see an adviser in the Foreign Language Department. Normally students beginning a new language will enroll in the 1A course. College credit may be earned in the class in which the student is placed. (See *Credit Allowance in Foreign Language.*)
3. Students who do not have the prescribed high school or college credit may elect to meet the foreign language requirement by passing a competence examination. Usually only lower division courses in foreign language may be passed by examination. Credit by examination will be granted in foreign language only prior to the completion of the first upper division course in the same foreign language and may be obtained only in languages taught at the college. See the chairman of the Foreign Language Department.
4. Students seeking a second bachelor's degree major or a master's degree will be held for any foreign language requirement in the field.
5. Unless the major specifies the language to be used, a foreign student may offer English to meet the requirement, provided his native language is not English and provided he has come to this country primarily to pursue academic work and expects to return to his home after completing his course of study.

GENERAL EDUCATION

Through its general education program, Fresno State College attempts to ensure to each student an opportunity to enlarge his awareness of areas which he may be unable to explore in depth but which are likely to enhance his appreciation of life experiences and his contributions to society.

The *California Administrative Code, Title 5,* provides for 40 units of general education-breadth requirements with a minimum of 32 in four specified areas (natural sciences, social sciences, humanities, and basic subject) and 8 in electives determined by the college. Fresno State interprets the requirements as outlined below. They are applicable to all undergraduate degree programs. See *College Level Examination Program* for application of credit earned by examination to the general education areas.

Transfer Students

Title 5 provides that general education-breadth requirements completed at an accredited college by a student who transfers to Fresno State shall be accepted to the extent stated in the certification provided by that college. Transfer students who have all of their general education requirements or a portion thereof certified as being complete and who change their majors after being admitted to Fresno State are advised that additional general education courses may be required for graduation due to the fact that major requirements and general education requirements are exclusive of each other.

Selection of Courses

The student is expected to exercise responsibility in the selection of general education courses which will complement his major, be compatible with his educational objectives, and provide an introduction to other areas and disciplines. He is urged to consult his adviser in constructing his program. General education requirements are *in addition* to specified unit requirements of the major. *No units used to satisfy requirements of the degree major may also be used to satisfy any part of the 40 units of general education-breadth requirement.* However, appropriate general education courses may be used toward completion of a minor or toward any "additional requirements" for the degree major. *Courses used to satisfy state history and government requirements and courses used to meet the graduation requirement in physical education may not also be used for general education.* (See *Special Course Requirements.*) Courses which meet general education requirements are listed in the appropriate departmental sections.

REQUIREMENTS

A minimum total of 32 units, shall include at least 2 courses and a minimum of 6 units selected from each of the first 4 areas. The additional 8 units to meet the state requirement of 40 units minimum may be selected from any of the 5 areas.

Area I. NATURAL SCIENCES

Animal Science: A Sci 10
Anthropology: Anth 1
Biology: Biol 10, 20, 120
Black Studies: Bl S 42
Botany. Bot 1, 10
Chemistry: Chem 1, 1A-B, 2A-B-C, 4A, 4B, 8
Communicative Disorders: C D 104
Geography: Geog 5, 7, 106, 108, 109, 146, 171
Geology: Geol 1, 1L, 2, 10, 12, 189, 189L
Physical Science: P Sci 10, 21
Physics: Phys 1A-B, 2A-B, 4A, 4B, 22A-B, 55
Physiology: Phy 1, 22, 23
Plant Science: Plant 30
Psychology: Psych 10
Zoology: Zool 1, 10

Area II. SOCIAL SCIENCES

Agricultural Economics: Ag Ec 31
Agriculture: Agri 161
Anthropology: Anth 2, 3, 102, 103, 104, 109, 114, 120, 122, 123, 124, 125, 126, 131, 150T
Armenian Studies: Arm S 60, 110, 133
Asian-American Studies: As Am 15, 30, 56, 110, 115, 140, 150
Black Studies: Bl S 36, 38, 131, 132, 135, 143, 145
Business Administration: B A 18, 118
Criminology: Crim 1, 120, 153
Economics: Econ 1A, 1B, 10, 15, 101, 102T, 110, 111, 151, 165, 180
Finance: Fin 137
Geography: Geog 2, 3, 4, 101, 102, 103, 116, 120, 177
History: Hist 3, 6, 7, 8, 133, 167, 168, 176, 177
Home Economics: H Ec 39, 131
Industrial Relations: Ind R 150
International Studies: I S C 93
Journalism: Jour 182, 184
La Raza Studies: La R 5, 6, 133
Management: Mgt 110A-B
Marketing: Mktg 100
Native American Studies: N A S 50, 103, 120
Physical Science: P Sci 108
Political Science: Pl Si 1, 10T, 120, 121, 122, 151
Psychology: Psych 60T, 145, 160T
Recreation: Rec 60
Social Welfare: S Wel 20
Sociology: Soc 1, 2, 25, 111, 112, 130, 143, 145, 151, 152, 157, 159, 162, 163, 165
Speech: Spch 7, 8, 142, 160
Urban and Regional Planning: U R P 100

Area III. HUMANITIES

Note: In Engl 20, and Phil 30 three units will be applied in this area; one unit of each course will be applied in Area IV.

Armenian Studies: Arm S 181
Art: Art 1, 5, 6, 10, 12, 15, 16, 20T, 25, 30, 41, 46, 51, 56, 60, 65, 70, 105T, 160, 168, 170, 171, 173, 174, 175, 176, 177, 178, 179
Black Studies: Bl S 25, 27, 35, 125
Communicative Disorders: C D 101
Drama: Drama 15, 22, 33, 34, 62, 115, 122, 137, 138, 139, 184, 185, 186, 187
English: Engl 20 (3 units), 41, 43, 44, 50T, 112-116, 146-148, 150-156, 161, 163, 164, 169T, 175T
French: Fren 109A-B, 110A-B, 111A-B, 112A-B, 118A-B, 148T, 160T
German: Germ 112A-B, 114, 116A-B, 118A-B, 146T, 160T

Greek: Grk 148
History: Hist 1, 110, 111, 112, 121, 131, 132
La Raza Studies: La R 7, 9, 101, 108, 120, 130, 132
Latin: Latin 131, 132, 148
Linguistics: Ling 134, 135, 137, 138
Music: Music 4-104, 6-106 through 27-127, 9, 31-131 through 35-135, 37-137, 38-138, 76T, 176T
Native American Studies: N A S 80, 100, 101
Philosophy: Phil 20T, 30, (3 units), 101, 102, 103, 104, 105, 106T
Physical Education: CPE 11, 16, 17A-B-C-D, 58
Radio-Television: R-TV 40, 128, 140, 143, 160, 173
Russian: Russ 103T, 118A-B, 148A-B
Spanish: Span 135, 163T, 164, 173, 176T, 177T
Speech: Spch 146, 148

Area IV. BASIC SUBJECT

Note: In Engl 20 and Phil 30 one unit will be applied in this area; three units will be applied in Area III.

Armenian: Arm 1A-B, 2A-B
Chinese: Chin 1A-B, 2A-B
Engineering: Engr 70
English: Engl 1, 20 (1 unit)
French: Fren 1A-B, 2A-B, 50A-B
German: Germ 1A-B, 2A-B, 50A-B
Greek: Grk 1A-B
International Studies: I S C 10, 21
Italian: Ital 1A-B
Japanese: Japn 1A-B, 2A-B
La Raza Studies: La R 12, 40A-B
Latin: Latin 1A-B, 2A-B
Linguistics: Ling 142, 143
Mathematics: Math 29, 30, 40, 41, 51, 71, 72, 75, 76, 103, 141
Office Administration: O Ad 105
Philosophy: Phil 25, 30 (1 unit)
Psychology: Psych 25
Quantitative Methods: Q M 60, 65
Russian: Russ 1A-B, 2A-B, 50A-B
Spanish: Span 1A-B, 20A-B, 40A-B, 50A-B
Speech: Spch 3

Area V. ELECTIVES

Animal Science: A Sci 70
Armenian Studies: Arm S 30T, 120T
Black Studies: Bl S 33, 144, 147, 148, 151, 178
Business Administration: B A 8, 10, 50
Dairy Industry: D Ind 23
Drama: Drama 188T
Enology: Enol 15
Finance: Fin 143, 144, 180
Food Science: F Sci 1
History: Hist 2, 136, 141, 142, 145, 146, 147, 171, 172, 173, 174A or B, 178, 183
Health Science: H S 90
Home Economics: H Ec 40, 42, 132
Honors: Honor 170
Industrial Arts: Ind A 133, 162, 178
Journalism: Jour 1, 2, 17, 113, 185, 186
La Raza Studies: La R 183
Linguistics: Ling 140T, 144
Marketing: Mktg 140, 150
Music: Music 40, 41, 161A-B, 162A-B
Philosophy: 115T, 125T, 130T, 135T

Physical Education: C, M, W, SC, SM, SW series, except C11, 16, 17A-B-C-D, 52, 53, 58, PE 144
Physical Science: P Sci 106
Plant Science: Plant 10, 15, 16, 21, 25, 40, 55, 65
Psychology: Psych 66, 111, 170T
Quantitative Methods: QM 162
Radio-Television: R-TV 188T
Speech: Spch 167

BACHELOR OF ARTS DEGREE

The bachelor of arts degree requires 124 semester units, of which at least 40 must be upper division. Upper division courses taken before the student has earned 45 units may not be applied on this 40-unit requirement.

General degree requirements, general education requirements, and one major must be satisfactorily completed. Units used to meet the general education requirements may not apply on the degree major. If a second concurrent major is desired, general education courses accepted for the first major may be used to satisfy requirements of the second major. Electives may be used to fulfill or to apply on requirements for a credential or for one or more minors, or they may be free electives selected with help of an adviser. A minor is not required for graduation, but students are encouraged to study departmental offerings and consult their advisers concerning the advisability of using one or more minors to complement their college programs. A graduating senior may request that the completion of any approved minor be recorded on his transcript.

BACHELOR OF SCIENCE DEGREE

Depending on the major field, the bachelor of science degree requires from 124 to 132 semester units except in engineering, which requires from 128 to 136 semester units. The general degree requirements, general education requirements, and one major must be satisfactorily completed. Courses used to meet the general education requirement may not apply on the major. If a second major is taken concurrently or consecutively, general education courses accepted for the first major may be used to satisfy requirements of the second major.

BACHELOR OF VOCATIONAL EDUCATION DEGREE

The bachelor of vocational education degree is a special degree limited to California vocational teachers recommended by the State Board of Examiners for Vocational Teachers. For requirements, see *Industrial Arts and Technology Department.*

DEGREE PROGRAMS, MAJORS, AND MINORS

The California State University, Fresno, offers majors for the baccalaureate degrees, minors, and master's degree programs as indicated below. Options are indented under the programs. Requirements for approved undergraduate majors and minors are listed in the appropriate school and department sections of the catalog. For master's degree program requirements, see *Graduate Bulletin.*

	Baccalaureate Degrees				Master's Degrees		
	BA	BS	Other	Minor	MA	MS	Other
Aerospace Studies				x			
Agricultural Business		x					
Agricultural Education		x					
Agricultural Science		x					
Options I and II							
Agriculture				x		x	
Anthropology	x			x			
Armenian				x			
Art	x			x	x		
Biology	x			x	x		
Black Studies				x			
Botany	x						
(see Biology MA)							
Business				x			
Business Administration		x				x	MBA
(BS) Accounting, Agribusiness, Business Economics, Finance, General Administration, Insurance, Legal Environment of Business, Marketing, Office Administration, Personnel and Industrial Relations, Quantitative Analysis, Real Estate and Urban Land Economics, Transportation and Physical Distribution Management							
Chemistry	x	x		x		x	
Child Development		x					
City and Regional Planning							MCRP
Communicative Disorders	x			x	x		
Counseling					x		
Criminology		x				x	
(BS) Corrections, Law Enforcement							
Drama (see Speech MA)							
Economics	x			x	x		
Education					x		
Engineering, Civil		x					
Engineering, Electrical		x					
Engineering, Industrial		x					
Engineering, Mechanical		x					
English	x				x		
(MA) Creative Writing							
Ethnic Studies				x			
French	x			x			
Geography	x			x	x		
(BA) Elementary Education							
Geology	x			x	x		
German	x			x			
Health Science	x			x		x	
(BA) Health and Safety, Environmental Health Science							
History	x			x	x		

	Baccalaureate Degrees				Master's Degrees		
	BA	BS	Other	Minor	MA	MS	Other
Home Economics	x			x		x	
(BA) Dietetics							
Industrial Arts	x		BVEd	x	x		
Industrial Technology		x					
(BS) Manufacturing Industries, Construction							
Journalism	x			x			
Advertising, News-Editorial, Public Relations, R-TV News Communication, Magazine Journalism, Photocommunication (see Mass Communication MA)							
La Raza Studies				x			
Latin				x			
Latin American Studies	x			x			
Linguistics	x			x	x		
(MA) French, German							
Mass Communication					x		
Print Media, Electronic Media							
Mathematics	x			x	x	x	
Microbiology	x	x			x		
(see Biology MA)							
Music	x			x	x		
(BA) Options I, II, III							
Nursing		x				x	
Office Administration				x			
Performing Arts Administration				x			
Philosophy	x			x			
Physical Education—Men	x			x	x		
Physical Education—Women	x			x	x		
(BA) General, Dance							
Physical Science				x			
Physical Therapy		x					
Physics	x	x		x	x	x	
(BS) Astronomy							
Political Science	x			x	x		
Psychology	x			x	x		
Public Administration	x			x			
(see Political Science MA)							
Radio-Television Broadcasting	x			x			
(see Speech, Mass Communication MA degrees)							
Recreation		x		x			
(BS) General, Therapeutic							
Rehabilitation Counseling					x		
Russian	x			x			
Social Science	x						
Social Welfare	x						
Social Work							MSW
Sociology	x			x			
Spanish	x			x	x		
Special (see below)	x						
Special Education					x		
Speech	x			x	x		
(BA) I, II							
Surveying and Photogrammetry		x					
Theatre Arts	x			x			
(See Speech MA)							
Zoology	x						
(see Biology MA)							

SPECIAL MAJOR FOR THE BACHELOR OF ARTS DEGREE

The special major for a bachelor of arts degree provides an opportunity for students to engage in an individualized course of study leading to a degree when legitimate academic and professional goals are not accommodated by standard degree majors. The special major consists of correlated studies in two or more fields. It is not intended as a means of bypassing normal graduation requirements or a means by which students may graduate who fail to complete the degree major in which they are enrolled.

The special major must be approved in the office of the Academic Vice President, with approval based upon a case-by-case justification. The candidate must have more than one full year of academic work (more than 30 units) still to be completed to meet minimum degree requirements. The minimum requirement for the special major is an approved program of at least 24 semester units of upper division work; units applied to satisfy general education requirements may not be counted.

A student requesting a special major must: 1) Prepare a statement giving his reasons for desiring a special major in terms of his academic and professional goals and why he cannot meet these goals through a standard major; 2) Develop a specific list of courses which would, in his opinion, lead to the academic and professional goals stated above; 3) Secure the signed approval of the department chairman in the areas from which the special major courses are drawn, and 4) Submit the foregoing material to the Office of the Academic Vice President for final approval.

PUBLIC SCHOOL CREDENTIALS

Fresno State is authorized by the State Board of Education to recommend candidates for public school service credentials in elementary and secondary teaching, administration, supervision, pupil personnel services and special education. Courses leading to specializations in administration, supervision, and junior college teaching are also offered.

All students must meet certain minimum requirements prior to admission to a credential program. The requirements are listed in the *School of Education.* Holders of bachelor's degrees must complete a minimum of 15 semester units of postgraduate work in residence at Fresno State to qualify for a university recommended teaching credential. Candidates for the administration, supervision, and pupil personnel services credential must complete at least one half of the required postgraduate work in residence.

Admission to Fresno State does not in itself include admission to credential programs, nor does it determine the catalog by which admission and program requirements shall be evaluated. Students planning to prepare for school service credentials, see *School of Education.*

For requirements for the following credentials see the *School of Education:*

The Standard Teaching Credential With a Specialization in Early Childhood Education, Elementary Teaching, or Secondary Teaching.
The Standard Designated Subjects Teaching Credential.
The Standard Designated Services Credential.
The Standard Supervision Credential.
The Standard Administration Credential.

COURSES OF INSTRUCTION

Courses of instruction are offered in the areas indicated below; titles, designations, descriptions, and unit values appear in the school and department sections of the Catalog. For innovative course groupings *see Special and Interdisciplinary Programs.*

School of Agricultural Sciences
- Agricultural Economics Department (Ag Ec)
- Agricultural Industry and Education Department
  - Agricultural Education (Ag Ed)
  - Agricultural Mechanics (Ag Me)
  - Agriculture (Agri)
  - Dairy Industry (D Ind)
  - Enology (Enol)
  - Food Science (F Sci)
- Animal Science Department (A Sci)
- Plant Science Department (Plant)

School of Business (Bus)
- Accounting and Quantitative Studies Department (Acct, Q M)
- Finance and Industry Department (B A, Fin)
- Management and Marketing Department (Ind R, Mgt, Mktg)
- Office Administration Department (O Ad)

School of Education
- Elementary Education Department (E Ed)
- Secondary Education Department (S Ed)
- Advanced Studies Department (A S)

Division of Engineering (Engr)

School of Graduate Studies
(Departmental graduate areas)

School of Humanities
- Art Department (Art)
- English (Engl)
- Foreign Language Department (FL)
  - Armenian (Arm)
  - French (Fren)
  - German (Germ)
  - Greek (Grk)
  - Italian (Ital)
  - Latin (Latin)
  - Portuguese (Port)
  - Russian (Russ)
  - Spanish (Span)
- Linguistics Department (Ling)
  - Chinese (Chin)
  - Japanese (Japn)
- Philosophy Department (Phil)

School of Natural Sciences
- Biology Department
  - Biology (Biol)
  - Botany (Bot)
  - Entomology (Ent)
  - Microbiology (Micro)
  - Physiology (Phy)
  - Zoology (Zool)
- Chemistry Department (Chem)
- Geology Department (Geol)
- Mathematics Department (Math)
- Physical Science (P Sci)
- Physics Department (Phys)
- Psychology Department (Psych)

School of Professional Studies
- Aerospace Studies Department (A Sp)
- Allied Health Professions Program
  - Physical Therapy (Ph Th)
  - Rehabilitation Counseling (R C)
- Communicative Disorders Department (C D)
- Criminology Department (Crim)
- Health Science Department (H S)
- Home Economics Department (H Ec)
- Industrial Arts and Technology Department (Ind A)
- Journalism Department (Jour)
- Music Department (Music)
- Nursing Department (Nurs)
- Physical Education and Recreation Department
  - Physical Education (P E, MPE, WPE, CPE, MPES, WPES)
  - Recreation (Rec)
- Radio-Television Department (R TV)
- Theatre Arts Department (Drama)

Courses are listed by number, title, course units and maximum total credit. Each unit generally represents one hour per week in class and two hours of preparation; courses involving laboratory, activity, or other application normally require additional hours of class attendance. Lecture-laboratory hours indicate deviation from the usual one class hour per week for one unit of credit. Course prerequisites are listed at the beginning of the course description. Course offerings are listed each semester in the *Schedule of Courses.*

School of Social Sciences
- Anthropology Department (Anth)
- Economics Department (Econ)
- Ethnic Studies Program (Eth S)
  - Armenian Studies (Arm S)
  - Asian American Studies (As Am)
  - Black Studies (Bl S)
  - La Raza Studies (La R)
  - Native American Studies (N A S)
- Geography Department (Geog)
- History Department (Hist)
- Political Science Department (Pl Si)
- Sociology Department (Soc)
- Speech Communication Department (Spch)
- Urban and Regional Planning Department (U R P)

School of Social Work
- Social Welfare Department (S Wel)
- Graduate Department of Social Work (S Wrk)

Special and Interdisciplinary Programs
- Computer Sciences (C S C)
- Honors, College (Honors)
- Honors, Departmental (H D)
- International Studies—Campus (I S C)
- International Studies—Abroad (I S A)
- Mass Communication (M Com)
- Moss Landing (M L)

COURSE NUMBERING SYSTEM

DEFINITIONS AND ELIGIBILITY

Numbers

1–99 *Lower division* (ld) courses designed for first- and second-year students, but open to others.

100–199 *Upper division* (ud) courses designed for third-, fourth-, and fifth-year students; enrollment permitted by second-semester sophomores with adequate preparation who have completed a minimum of 45 units. Counted as graduate work for students with graduate status; permitted for use on a master's degree program only with departmental approval.

190 Independent study, undergraduate.

100G–199G For *graduate* students only; designed for use in the first year of two-year master's degree programs; intensive combination of material normally offered at the undergraduate level.

200–299 *Graduate courses* open to holders of baccalaureate degrees and, with prior approval of the instructor, to second-semester seniors with superior preparation and ability; designed for use on master's degree programs; when taught by extension, count as upper divison in master's degree programs.

290 Independent study, graduate.

299 Master's degree thesis or project.

300–399 Designed to meet professional needs which cannot be served by regular established course offerings. *These courses are offered only through extension and summer sessions.* They assume completion of the bachelor's degree and/or appropriate professional service and are focused upon the problems that enrolled students encounter in their professional service. Although these courses are designed primarily for purposes other than the partial fulfillment of degree and credential requirements, they may, with approval by the department, be applied toward the major. They may be used as part of the forty-unit upper division requirement for the BA degree and as electives in the fulfillment of the total requirements for a baccalaureate degree and/or credential. They may not be used to meet the requirements of a master's degree.

Symbols

A-B Two-semester course taken in sequence.

A,B Listed as separate courses, may be taken independently.

F Field course.

L Laboratory associated with another course.

T Topics course, varied area subject matter, repeatable for credit.

SPECIAL AND INTERDISCIPLINARY PROGRAMS

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SALE TODA

SPECIAL AND INTERDISCIPLINARY PROGRAMS

The college has certain programs whose organization or administration does not fall within a single department. These programs are described or referred to in this section. Successful completion of courses in these programs, with minor exceptions, will lead to credit which may be applicable to certain departmental or college requirements. Interested students should consult the appropriate advisers.

ASIAN AREA COURSES

Fresno State offers courses in many disciplines which are concerned with South, Southeast, and East Asia. Although there is no degree program in Asian Studies, by appropriate selection of electives a student can secure a useful background of study in this area as preparation either for graduate study or for his vocation. The faculty advisers in this area are: P. J. Mistry (Linguistics), S. Chang (History), G. Nasse (Geography) and S. M. Opper (Art).

The following list includes the upper division and graduate courses most directly concerned:

Anthropology 103. Anthropology of Modernization (3)
Anthropology 123. Peoples and Cultures of Southeast Asia (3)
Anthropology 124. Peoples and Cultures of East Asia (3)
Art 105T. Topics in Art History (3)
  Indian Art History
  Chinese Art History
  Japanese Art History
Art 260. Seminar in Art History (3)
Economics 114. Economics of Underdeveloped Areas (3)
Geography 126. Australia, New Zealand, and the Pacific Islands (3)
Geography 128T. Asian Regions (3)
  Geography of East Asia
  Geography of South Asia
  Geography of Southeast Asia
  Geography of Southwest Asia
Geography 270T. Seminar in Selected Regions (1–3; max total 6)
History 6. East Asian Civilization I (3)
History 7. East Asian Civilization II (3)
History 104A. Modern China (3)
History 104B. Recent China (3)
History 104C. Sino-United States Relations (3)
History 105A. Japan and Korea (3)
History 105B. Japan and Korea (3)
History 106. India and Pakistan (3)
History 107. Southeast Asia (3)
History 109T. Studies in Oriental and African History (3; max total 6)
History 205T. Seminar in Far Eastern History (3)
Linguistics (Foreign Language)
  Chinese 1A. Elementary Chinese (4)
  Chinese 2A. Intermediate Chinese (4)
  Japanese 1A. Elementary Japanese (4)
  Japanese 2A. Intermediate Japanese (4)
Philosophy 130T. Religious Studies (3)
Political Science 145T. Area Studies in Asia (1–4; max total 8 if no area repeated).
Political Science 183. Comparative Administration (3)

Departmental Independent Study (190 and 290) courses may be used to pursue topics of special interest or explore related topics in greater depth.
Consult the appropriate departmental section of this catalog for course descriptions and prerequisites.

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MAJOR IN CHILD DEVELOPMENT

Fresno State offers an interdisciplinary major leading to the Bachelor of Science Degree in Child Development. The major is appropriate for students interested in vocational opportunities based on children. It may lead to employment in the areas of preschool, child center, private nursery, early childhood and elementary teaching, special programs for disadvantaged children, special education, adult education programs, and other child-related vocations. The program includes a behavioral science base from psychology, sociology, and anthropology; home economics and human development courses in child study, family relationships, and nutrition; and courses on young children which are offered in the departments of art, communicative disorders, drama, health science, linguistics, music, physical education, social work, and speech.

The major consists of nine basic areas with alternates to be selected according to career objectives.

	Units
H Ec 39	3
H Ec 131, Soc 165, or H Ec 161	3
H Ec 139	3
Psych 119	3
Anth 113, Psych 145, Soc 162, Spch 108 or 162	3
Psych 140T (Statistics), 163, 168, 170T (Social Implications of Communicative Disorders; Race, Social Class, Ethnicity), 174; Soc 111, 143, 151, 163	6
CD 100, 102, Ling 134, 146, Spch 114 or 164	3
H Ec 40, 182T (Institutional Feeding of Children), S Wel 122T (Child Welfare), H S 123	6
Art 164, Music 155, PE 152, or Drama 137	8
	38

Under the restrictions of the major, students may make approved adaptations in their programs to fulfill specific needs and career objectives. Students interested in this interdisciplinary major should consult the School of Education for assistance in program planning and assignment of advisers. (See brochure on *Child Development*, Elementary Education Department, for additional information.)

CLASSICAL STUDIES COURSES

Although the college does not offer a bachelor's degree program in classical studies, there are many courses in several disciplines which are concerned with this subject. By appropriate selection of courses in the area as electives or within the requirements of various majors, a student can secure a useful background of study as preparation either for graduate study or for his vocation.

The following list includes the courses most directly concerned. For further information consult the Coordinator of Classical Studies, Dr. Stephen Benko, Department of History.

Art 5. History of Art (3)
Art 105T. Topics in Art History: The Ancient World (3)
Drama 185. Seminar: History of the Theatre and Drama (3)
English 112. World Literature: Ancient (4)
English 113. World Literature: Medieval (4)
English 169T. Forms of Literature: Comedy (4)
Mythology (4)
English 191T. Independent Reading: World Literature, Ancient-Medieval (1–4)
Foreign Languages
Greek 1A-B. Elementary Greek (3–3)
Greek 148. Greek Literature in Translation (3)
Latin 1A-B. Elementary Latin (3–3)
Latin 2A-B. Intermediate Latin (3–3)
Latin 101A-B. Advanced Grammar and Composition (3–3)
Latin 131. Classical Latin (3)
Latin 132. Medieval and Renaissance Latin (3)

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Latin 148. Roman Literature in Translation (3)
Latin 190. Independent Study (1–3)
History 1. Western Civilization to 1650 (3)
History 108. History of Ancient Israel (3)
History 110. Ancient Fertile Crescent (3)
History 111. Ancient Greece (3)
History 112. Ancient Rome (3)
History 119T. Studies in Ancient and Medieval History (3)
History 120. Byzantine History (3)
History 190. Independent Study (1–3)
History 201. Reading Seminar: Ancient Historians (3)
History 210T. Seminar in Ancient History: Imperial Roman Civilization (3; max total 6)
Philosophy 101. Ancient Philosophy (3)
Philosophy 116. History of Ethics (3)
Philosophy 160T. Seminar in Historical Problems: Plato, Aristotle (3–4)
Philosophy 190. Independent Study (1–3)
Physical Science 106. History and Philosophy of Physical Science (3)
Political Science 110. History of Political Thought to Macchiavelli (3)
Speech 145. History of Public Address: Ancient (3)

EXPERIMENTAL COLLEGE

Within the university the Experimental College is designed to facilitate educational experimentation. It encourages the development of kinds of learning which may involve departures from current methods of instruction and scheduling, unit allocations, discipline boundaries, and relations between students and instructors.

The program is under the supervision of the Experimental College Committee which is composed of both students and faculty. Courses instituted under it may not continue longer than three years. On the basis of an evaluation within that time, for which the committee and relevant departments are responsible, a course must either be accepted for catalog listing by regular procedures or be dropped.

Proposals for the program may be initiated by faculty members, by departments, by members of the administration, and by students. The committee gives priority to those proposals which appear to have the greatest merit as potential contributions to the total program of the college and which show some special need for immediate implementation or preliminary testing.

Experimental College courses count toward the unit requirement for graduation. Applicability to major and general education requirements is determined by the appropriate agency in each case.

Courses in the Experimental College appear in the *Schedule of Courses* with an EXP prefix. Normally, a special bulletin published each semester will provide course descriptions and other information concerning the program since they do not appear in the *General Catalog* until they are accepted as regular course offerings.

HONORS PROGRAM

Fresno State has replaced the honors program begun in 1964 with a new one. It is designed to provide the superior undergraduate student with additional opportunities for the challenging academic experiences provided by interaction with superior students from other disciplines, consideration of broad and interdisciplinary topics of current and classical interest, and the opportunity to partially satisfy the requirements of his major through special work in his department which has been adapted to his advanced interests and capabilities.

The honors program provides for graduation with departmental honors for students who complete a 12-unit departmental program and, in addition, complete at least two interdisciplinary honors seminars for a total of at least three units. Admission to the program is limited to students having a grade-point average of 3.25 or better and who have completed 45 units. These limitations may be waived in exceptional cases. Enrollment in the interdisciplinary seminars is by application to the Coordinator of the Honors Program. Enrollment in the departmental program is by application to the Department Chairman. Consult the Coordinator for further information.

HONORS SEMINARS (Honor)

Honors seminar courses (the Honor 170 series) are designed to explore the interdisciplinary aspects of general topics which are selected each semester by the Honors Committee. Specific topics will be listed in the *Schedule of Courses.* They will be offered for 1 or 2 units of credit for a maximum total of 3 units. Honors seminars will meet requirements of general education, Area V.

DEPARTMENTAL HONORS PROGRAM

Programs in participating departments will become available in the 1971–72 academic year and will consist of 12 units of special work replacing a portion of the major requirements. This work will emphasize the student's independent pursuit of knowledge and a working association with a faculty member of the department. Special seminars or sections of existing courses may be used to augment independent work. Admission will be based upon an evaluation of the student's ability to undertake independent and advanced work.

INTERNATIONAL PROGRAMS

The college offers two programs under this heading. A campus program is intended for students who are admitted to the college from foreign countries but who had their education in some other language than English. The California State University and Colleges offer an overseas program which provides an opportunity for American students to study abroad.

CAMPUS PROGRAM

The International Program (Campus) provides courses intended to help the foreign student whose previous instruction has been in a language other than English gain adequate skill in the use of the English language and sufficient familiarity with American customs and tradition to obtain maximum benefit from his experience at an American college. The following program is required of all entering foreign students, unless excused from part or all of it by the Admissions Committee on the advice of the persons concerned with the instruction and administration of the program. This decision will be based on a consideration of test scores and other data supplied by the student with his application. (See *Admission to the College—Entrance Examinations*). After arrival at the college, examinations and an interview may lead to the student's being excused from certain courses.

First Semester Program: Most students will be required to enroll in I S C 10, 21, and 93 in the first semester of residence. In addition, students with less skill in English will be required to take I S C 1 and 2. With permission of his adviser, a student may enroll in other regular courses.

Other Undergraduate Courses: Two other English language courses, I S C 110 and 121, will be taken during the second semester of residence unless the foreign student is advised that they are unnecessary for him. During his last year in college he will enroll in I S C 195.

Courses Taken in Graduate Standing: An entering graduate student whose previous education has been in a language other than English is held to the same standards of English proficiency as are undergraduate students and may be required to enroll in the above-listed undergraduate courses when considered necessary by his advisers. Graduate students may elect to take I S C 193, but will be required to enroll in I S C 293 and 295.

COURSES (I S C)

1. Oral English: Pronunciation (2)
Prerequisite: permission of instructor. The sound patterns of American English. Sound contrasts and stress, rhythm and intonation drills.

2. English Sentence Patterns (2)
Prerequisite: permission of instructor. Practice in the use of intermediate and advanced grammatical patterns. Reading comprehension and vocabulary building.

10. English Composition for Foreign Students (3)
Prerequisite: permission of instructor. Study and practice of complex sentence types, including embedding, permutation, expansion, etc. Vocabulary development; critical reading; paragraph and essay composition.

12. English for Spanish Speakers (3) (Same as La R 12)
Theory and practice of spoken and written English with special reference to the problems of speakers of Spanish.

21. Introduction to Public Speaking for Foreign Students (3)
Prerequisite: permission of instructor. Advanced drills in articulation, intonation, rhythm, and word and sentence stress. Speech composition including organization, delivery, and support.

30. Basic Typing for Foreign Students (2)
Prerequisite: permission of instructor. Development of basic typewriting techniques. Use of the typewriter as a communication tool.

93. Problems in Contemporary American Society (3)
Prerequisite: permission of instructor. Examination of problems in contemporary American society designed to familiarize the foreign student with political and social ideas and ideological conflicts he will encounter in his new environment. Individual student projects.

110. Advanced Composition for Foreign Students (3)
Prerequisite: permission of instructor. Research techniques; rhetorical theory; critical reading.

121. Advanced Public Speaking for Foreign Students (3)
Prerequisite: permission of instructor. Advanced practice in expository and persuasive speaking. Analysis of propaganda. Study of techniques of persuasion; group discussion.

193. Introduction to American Culture (3)
Prerequisite: permission of instructor. Analysis and discussion of major figures and movements which represent the American tradition in social-intellectual history, literature, and the arts (painting, architecture, jazz, folk, and concert music).

195. Interpretation and Anaylsis (3)
Open only to undergraduate students from abroad. Prerequisite: permission of instructor. Individual analysis of the knowledge and skills of the student's field of study; application to problems in the country in which the knowledge and skills are to be applied. Scholarly paper.

GRADUATE COURSES I S C

293. Contemporary America (3)
Open only to students from abroad. Prerequisite: graduate standing and permission of instructor. Seminar including studies from areas of anthropology, economics, history, literature, political science, psychology, sociology, and related fields. (See *School of Graduate Studies.*)

295. Interpretation and Analysis (3)
Open only to graduate students from abroad. Prerequisite: permission of instructor. Individual analysis of the knowledge and skills of the student's field of study; application to problems in the country in which the knowledge and skills are to be applied. Scholarly paper. (See *School of Graduate Studies.*)

INTERNATIONAL PROGRAM (OVERSEAS)

A study abroad program of global scope is offered by the California State System through the California State University and Colleges International Programs. Study opportunities for students from all nineteen campuses include full-year curricula at distinguished institutions of higher learning throughout the world.

Cooperating universities abroad include the University of Provence, France; the Free University of Berlin and the University of Heidelberg, Germany; the University of Florence, Italy; the University of Stockholm and the University of Uppsala, Sweden; the University of Madrid and the University of Granada, Spain; Tel Aviv University and the Hebrew University of Jerusalem, Israel; Waseda University, Japan. In the United Kingdom, cooperating universities, which may vary from year to year, have included Dundee, Leicester, Liverpool, London, Oxford, Sheffield, Southampton, and Wales. An area studies

program, with instruction in English, is also available in Taiwan, Republic of China.

Selected students remain enrolled and continue to earn residence credit at their California campus. Full credit is earned for academic work successfully completed at the cooperating institutions abroad. Application of credit earned toward the degree requirements of the home campus is in accordance with college regulations. Students are selected from each campus on the basis of academic, linguistic, and personal qualifications, as well as career objectives. Requirements include:

(a) Upper division or graduate standing by the beginning of the academic year abroad;
(b) Grades of B (3.0) or better in 30 semester units or 45 quarter units;
(c) Proficiency in the language of instruction, as specified below;
(d) Faculty recommendations.

Proficiency in the language of the host country is a requirement for the programs in France, Germany, Italy (except for students applying for the area studies program), and Spain. Even where language proficiency is not required, competence in the language of the host country will assure broader curricular opportunities.

Application for the 1973–74 academic year must be submitted before March 1, 1973 (except for United Kingdom applicants who must submit applications by January 5, 1973). Applicants are notified of acceptance by April 1, 1973. Detailed information may be obtained from the Office of the Dean of Student Affairs or by writing to the California State University and Colleges International Programs, 5670 Wilshire Boulevard, Los Angeles, California 90036.

Average expenses for the entire year—including round-trip transportation between California and the study centers, room and board, health and accident insurance, home campus fees, moderate vacation traveling, textbooks, and personal expenses—range from $2,600 to $3,050. Students ordinarily remain eligible for any financial aids for which they otherwise would qualify on their home campus.

COURSES (I S A)

Fresno State College students under the California State University and Colleges International Programs register concurrently at Fresno State College and at the host institution abroad, with credit assigned in terms of Fresno courses. Undergraduate students who find appropriate study opportunities at the host institution but no counterpart course Fresno State College may use Independent Study (190), and International Study Abroad 92 or 192. Graduate students may use Independent Study (290), and International Study 292.

92. Projects in Study Abroad: (Subject) (1–3; max total 6)
Open only to students in California State University and Colleges International Programs. Study undertaken in a university abroad under the auspices of the California State University and Colleges.

192. Projects in Study Abroad: (Subject) (1–3; max total 6)
Open only to students in California State University and Colleges International Programs. Study undertaken in a university abroad under the auspices of the California State University and Colleges.

292. Projects in Study Abroad: (Subject) (1–3; max total 18)
One- to three-unit registrations. Prerequisite: admission to master's degree program; written plan approved by the Fresno State instructor, department chairman, and the Dean of the School of Graduate Studies. May require one or more papers and oral or written examination on the student's return, pending which In Progress (IP) grade will be recorded.

LATIN AMERICAN STUDIES

The Latin American Studies major and minor are designed to meet the needs of students interested in an academic interdisciplinary major, those who wish to broaden their studies in a given discipline with a background in the Latin American area, and those who are interested in obtaining a teaching credential. Students following this program will be assigned to a faculty adviser in the Foreign Language or History Department.

Students who wish to major or minor in Latin American Studies must complete Span 20A-B or equivalent. Lower division prerequisites for required courses listed in the major and

minor below include Hist 2, 3, or 8, Anth 2, and Pl Si 1 or 2.

MAJOR

	Units
Hist 162, 163A-B, 164, 165B, 166	6
Span 126, 153, 154, 176T, 177T	6
Anth 120, 121, Econ 188T, Geog 142, 143, Pl Si 146T	6
Electives (including any of the above courses not already used):	
Geog 280T, Hist 160A-B, 161, 165A, 169T, 183, 188	12
	30

MINOR

A minor in Latin American Studies is recommended for a student who is completing a recognized college major in another discipline and wishes to indicate on his transcript a background in Latin American Studies.

	Units
Hist 162, 163A-B, 164, 165B, 166	3
Span 126, 176T, 177T	3
Anth 120, 121, Econ 188T, Geog 142, 143, Pl Si 146T	6
Approved electives to be selected from any of the courses approved for the major, but not used to meet line requirements above	9
	21

MOSS LANDING MARINE LABORATORIES

The California State University and Colleges began operation of the Moss Landing Marine Laboratories, Moss Landing, California, in the fall semester 1966. This facility functions as a seaside extension of the campuses of five cooperating state universities (Fresno, Hayward, Sacramento, San Francisco, and San Jose). It offers full-time course work in marine biology, oceanography, and other marine sciences for majors in either the biological (botany, biology, zoology) or physical sciences whose objectives include further graduate study, teaching the sciences, or research in the marine sciences. Properly qualified upper division and graduate students may enroll on the Fresno State campus for a term of instruction at Moss Landing and earn resident credit for such course work. Since enrollment is limited, interested students should make early application. Consult the chairman of the Biology Department for details. See *Geology Department* for on-campus course work in general oceanography and geology courses related to marine science.

COURSES (M Sci)

Note: The following courses are taught at the Monterey Bay location of the Moss Landing Marine Laboratories. For course descriptions see Biology Department.

101 General Oceanography (4)
102. Marine Science Techniques (3)
111. Zoology of Marine Vertebrates (4)
121. Marine Invertebrate Zoology (4)
131. Marine Algology (4)
133. Micropaleontology (3)
135. Marine Meteorology (3)
136. Physical and Chemical Oceanography (3)
137. Marine Biogenic Sediments (3)
141. Geological Oceanography (3)
153. Marine Science Diving (2)
161. Marine Ecology (4)
180. Special Problems in the Marine Sciences (1–4)
181. Literature of the Marine Sciences (1)
185T. Topics in Marine Science (1–6)
262. Advanced Marine Ecology (3)
277. Human Geography and Ecology of Monterey Bay (3)
282. Seminar in the Marine Sciences (2)

315 1 2 5 995

283. Advanced Studies in the Marine Sciences (3) (Former M L 281)
285T. Advanced Topics in Marine Sciences (1–6)
298. Research in the Marine Sciences (1–4)
299. Thesis (1–4)

RELIGIOUS STUDIES COURSES

Although the college does not offer a bachelor's degree program in religious studies, several departments offer courses appropriate to the area. By choosing from among the courses listed below, a pretheological student can fulfill the entrance requirements of any school affiliated with the American Association of Theological Schools, or of any graduate school of religion from which an advanced degree may be sought. Students wishing to enroll in courses in religious studies, either for use as electives or as pretheological preparation, should consult the pretheological adviser.

Anthropology 150T. Topics in Anthropology: Anthropological Approaches to Religion.
Art 105T. Topics in Art History: Oriental Art; Medieval Art
English/Philosophy 115. Bible as Literature (Former Engl 159T9)
English/Philosophy 116. Old Testament (Former Engl 159T9)
History 119T. Studies in Ancient and Medieval History
History 120. Byzantine History
History 121. Formation of the Medieval Order
History 122. Disintegration of the Medieval Order
History 132. Reformation
History 179T Studies in United States History: Religious Factor in United States History
Philosophy 20T. Introductory Topics in Philosophy: Religion and Ethics
Philosophy 115T. Theory of Value and Obligation
Philosophy 130T. Religious Studies
Philosophy 175T. Seminar in Religious Issues
Psychology 170T. Topics in Applied Psychology: Psychology of Religion
Sociology 159. Sociology of Religion

WOMEN'S STUDIES COURSES (W S)

Although the college does not offer a bachelor's degree program in Women's Studies, it does provide a number of courses in several disciplines. These are designed to develop awareness of the contributions of women throughout history and the roles in which they have been cast as well as to help women discover what is pertinent to themselves and their abilities. Women's Studies courses are listed below. W S 100, the Second Sex, is interdisciplinary in nature. It is the core course and can serve as an introduction to the other courses, but it is not prerequisite to them.

COURSES (W S)

50T. Studies in Literature (4) (See Engl 50T)
Women in Novels. Emphasis on the treatment of women by major writers throughout the centuries; emergence of the consciousness of sexual inequality as it appears in literature. Readings and analysis.

100. The Second Sex (3)
Introductory interdisciplinary course to provide a foundation for Women's Studies; focus is on women in the areas of sociology, psychology, history, economics, and the arts.

105. Education and Sexual Mythology (3)
Study of ways in which schools have perpetuated sexual mythology; emphasis on improving attitudes and procedures which will counteract sex role stereotyping.

110. Women in Sports (3)
Historical review of women athletes in their struggle with societal stereotypes.

118. Woman in History (3) (See Hist 118)

120T. Topics in Studio Processes (3) (See Art 120T)
Feminist Art. Multimedia art; emphasis on developing female images and symbols in art; problems of women artists.

122T. Topics in Social Welfare (3) (See S Wel 122T)
Women in the Social Welfare System. Evaluation of the position of women in the United States social welfare system; roles of women as leaders in American social reform, as major architects of the profession of social work, and as recipients of social services.

131. Sociology of Sex Roles (3) (See Soc 131)

145. Women in the Theatre (3) (See Drama 145)

163. Women in Music (3) (See Music 163)

169T. Forms of Literature (4) (See Engl 169T)
Women in Contemporary American and British Literature. Women authors and characters in 20th century American and British literature.

170T. Women Writers (3; max total 12) (See F L 170T)

193T. Seminar in Literary Studies (4) (See Engl 193T)
Myth and Archetype of Women. Prerequisite: permission of instructor. Popular myths and archetypes of women as they appear in the Bible, classical mythology, folk mythology and contemporary literature. Readings, analysis, reports, term papers.

INTERDISCIPLINARY GRADUATE STUDY

The School of Graduate Studies provides administrative coordination for graduate interdisciplinary programs and courses. Fresno State College is currently authorized to offer one interdisciplinary graduate program as well as several groups of courses which are interdisciplinary in scope.

MASS COMMUNICATION

The master of arts degree in mass communication is based on the equivalent of an undergraduate major in journalism or radio-television broadcasting. Options in print media and electronic media are administered by the Journalism and the Radio-Television Departments, respectively. Fifteen of the 30 required units for the degree must be in graduate mass communication courses; 12 units must be core courses. For specific requirements, consult the departmental graduate advisers or see the *Graduate Bulletin.*

COURSES (M Com)

(See Course Numbering System—Definitions and Eligibility)

201. Seminar in Theory and Research (3)
(Core) Theory of the mass media, its development and application; basic research methodologies applicable in the various areas of the mass media.

202. Seminar in Literature of Mass Communications (3; max total 6)
(Core) Critical examination of the literature in the field of mass communication. Exploration of the concepts in various areas through a study of primary, secondary, and tertiary literary resources.

204T. Seminar in Journalism (3; max total 9)
Seminar in a print media topic: government information policy, news media and urban affairs, social responsibility in public relations, magazine influence in America.

205T. Seminar in Radio-Television-Film (3; max total 9)
Seminar in an electronic media topic: current regulatory issues, quantitative research, ETV/ITV problems, film as social comment.

230. Criticism of Broadcasting and Film (3)
Development of ethical, artistic, and critical standards for broadcast and motion picture evaluation. Principles of criticism are traced from an historical to a contemporary context. Research papers and reports required.

250. Comparative and International Broadcasting (3)
Formal study of national systems of broadcasting and the social, geographic, and political forces that have shaped national roles in international communications. Research papers required.

290. Independent Study (1–3; max total 6)
(See *General Information-Independent Study.*

299. Thesis (2–6)
(Core) Prerequisite: see *Master's Degrees-Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the Master's degree.

BEHAVIORAL SCIENCE COURSES

Certain graduate courses have been grouped to provide an interdisciplinary approach to the planning and implementation of change. Emphasis is on the development and application of planned change techniques to groups in business, education, social welfare, and governmental organizations. The selected graduate courses are from areas such as business, education, psychology, social work, and speech. They are designed to provide a knowledge of behavioral science principles and skills to students who wish to apply such knowledge within their own graduate areas. Courses currently applicable include: Business 223 Seminar in Organizational Behavior, Psychology 270T Seminar in Applied Behavioral Science, Social Work 273T Seminar in Social Work Practices, and Speech 215 Seminar in Speech Arts. For further information about courses available, consult the office of the Dean of the School of Graduate Studies.

COMPUTER SCIENCE COURSES (C S C)

In addition to the graduate courses listed below, several undergraduate courses dealing with computers are offered by various departments of the college. They are grouped here for the convenience of students who are interested in the study of computer science or computer applications in specific fields. (See departmental listings for undergraduate course descriptions.)

C S C 180T. Programming in Specialized Computer Languages (2–3)
Q M 63 Automation and Computer Languages—FORTRAN (3)
Q M 64 Automation and Computer Languages—COBOL (3)
Q M 162 Advanced Computer Programming (3)
Q M 166 Applied Computer Systems (3)
Q M 168 Data Processing Management (3)
Q M 169 Machine Language Programming (3)
Q M 173 Computer Configuration (3)
Engr 70 Computer Programming (2)
Psych 140T Computer Applications in Psychology (3)

GRADUATE COURSES (C S C)

Note: Prerequisite to all graduate courses: Math 72, EE 106, Q M 63 or 64, 169, or equivalent, or permission of instructor.

210. Information Structures (3)
Structural representation of information; linear lists, strings, arrays, and orthogonal lists; tree and graph structures; multilinked structures; storage systems; storage allocation and utilization; symbol tables; searching and sorting techniques.

220. Programming Languages (3)
Syntax and semantics specification of languages; parsing; properties of algorithmic languages; list processing, string manipulation, multipurpose, and simulation languages.

227. Computational Methods for Time Series Data (3)
Prerequisite: Math 107 or equivalent; permission of instructor. Digital processing of single- and multi-channel time series data and preparation of Fortran programs. Z-transforms; correlation and spectral analysis; recursive and convolution filtering; beamforming; power spectrum estimation, other signal-to-noise ratio improvement and signal detection methods.

230. Organization of Computing Systems (3)
Logic and memory elements; Boolean functions and minimizations; digital arithmetic, storage, control, and input-output facilities; system organization, multiprogramming, multiprocessing, and real-time features.

250. Systems Programming (3)
Prerequisite: C S C 210, 220, and 230. Batch processing programs, characteristics, and limitations; multiprogramming and multiprocessing systems; addressing techniques, core management, file system design and management, system accounting, and operating system behavior.

SCHOOL OF GRADUATE STUDIES

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SCHOOL OF GRADUATE STUDIES

Phyllis Welch Watts, Dean

Assistant Dean ..... Robert L. Shacklett

The School of Graduate Studies embraces all graduate programs and activities in the college, including programs leading to the master of arts degree in 25 fields, the master of science degree in 9 fields, the master of business administration, the master of social work, and the master of city and regional planning. Graduate degree curricula are designed both as the first graduate degree for students contemplating doctoral study and as terminal degrees for persons engaged in business administration, public school teaching including junior college, social work, and other fields in which the master's degree is ordinarily the highest degree earned.

The Office of the Dean of the School of Graduate Studies is responsible for the general administration of graduate degree programs in accordance with the policies developed by the Graduate Council. Curricula and requirements are detailed in the *Graduate Bulletin.* Inquiries should be directed to the School of Graduate Studies, California State University, Fresno.

Student advisement and the instructional program in specific master's degree curricula are generally the responsibility of the department or school graduate committees, and are administered by the chairman of the graduate committee in that area.

Fresno State is authorized to grant the master's degrees listed below. Authorized options or concentrations under the degree program are also shown.

- Agriculture, MS
- Art, MA
- Biology, MA
- Business, MBA, MSBA
- Chemistry, MS
- City and Regional Planning, MCRP
- Communicative Disorders, MA
- Counseling, MA
- Criminology, MS
  - Law Enforcement
  - Corrections
- Economics, MA
- Education, MA
  - Administration and Supervision
  - Educational Theory
  - Elementary Teaching
  - Secondary Teaching
- English, MA
  - Creative Writing
- French, MA
- Geography, MA
- Geology, MA
- German, MA
- Health Science, MS
- History, MA
- Home Economics, MS
  - Dietetics and Nutrition
- Industrial Arts, MA
- Linguistics, MA
  - French
  - German
- Mass Communication, MA
  - Print Media
  - Electronic Media
- Mathematics, MA, MS
- Microbiology, MA
- Music, MA
- Nursing, MS
  - Clinical
  - Administration-Supervision
  - Teaching
- Physical Education, MA
- Physics, MA, MS
- Political Science, MA
  - Government
  - Public Administration
- Psychology, MA
- Rehabilitation Counseling, MA
- Social Work, MSW
- Spanish, MA
- Special Education, MA
- Speech, MA

ADMISSION TO GRADUATE STANDING

Admission standards are stated in the *California Administrative Code, Title 5, Education,* which provides uniform admission regulations for all California state colleges as follows:

41000. Admission with Graduate Standing: Unclassified. (a) For admission with graduate standing as an unclassified graduate student, a student shall have completed a four-year college course and hold an acceptable baccalaureate degree from an accredited institution; or shall have completed equivalent academic preparation as determined by the appropriate college authorities.

(b) Admission to a state college with graduate standing does not constitute admission to graduate degree curricula.

41001. Admission to Graduate Degree Curricula: Classified. A student who has been admitted to a state college under Section 41000 may, upon application, be admitted to an authorized graduate degree curriculum of the college as a classified graduate student if he satisfactorily meets the professional, personal, scholastic, and other standards for graduate study, including qualifying examinations, as the appropriate college authorities may prescribe. Only those applicants who show promise of success and fitness will be admitted to graduate degree curricula, and only those who continue to demonstrate a satisfactory level of scholastic competence and fitness, as determined by the appropriate college authorities, shall be eligible to continue in such curricula. Students whose performance in a graduate degree curriculum is judged to be unsatisfactory by the authorities of the college may be required to withdraw from all graduate degree curricula offered by the college.

GRADUATE ADMISSION PROCEDURES

Graduate admission is a two-step process. *Unclassified graduate standing,* the first step, is required of all holders of bachelor's degrees, regardless of objective. *Classified graduate standing,* the second step, is required only of students working toward master's degrees. Students from abroad see *Foreign Graduate Student Programs.*

UNCLASSIFIED GRADUATE STANDING

For admission with a graduate standing as an Unclassified Graduate Student, a student shall have completed a four-year college course and hold an acceptable baccalaureate degree from an accredited institution, or shall have completed equivalent academic preparation as determined by the appropriate college authorities; and must satisfactorily meet the professional, personal, scholastic, and other standards for graduate study, including qualifying examinations, as the appropriate college authorities may prescribe. This status permits him to enroll in courses for which he has the prerequisites.

1. *A graduate of Fresno State who has taken no subsequent collegiate work elsewhere* may be admitted to *unclassified graduate standing* upon the filing of the application for graduate standing.

2. *A graduate of another accredited institution, or a Fresno State graduate who has subsequently attended another institution,* may be admitted to unclassified graduate standing upon the filing of the application and two copies of official transcripts showing the highest degree earned and good standing in all work taken subsequent to that degree. A third copy of the transcript may be required in some fields.

3. *Provisional Graduate Standing. A student who does not have a degree or credential objective* may be admitted with *provisional graduate standing* upon the filing of the application declaring all schools attended since high school and one copy of an official transcript showing the granting of the bachelor's degree. (Transcripts for bachelor's degrees earned at Fresno State College are already on file and need not be resubmitted.) Subsequent changes to degree or credential applicant status will necessitate the filing of any additional transcripts required for *classified or unclassified graduate standing.*

4. *Unvalidated Graduate Standing. A graduate of a nonaccredited college* may be granted admission with *unvalidated graduate standing,* upon the filing of the application and two copies of official transcripts of all college work. Such a student may be eligible for unclassified graduate standing when he has cleared all undergraduate deficiencies and has maintained, in residence at Fresno State, a grade-point average of 3.0 (on a four grade-point system) on 12 units of approved upper division work or an average of 2.5 on 24 units of approved upper division work. (Potential master's degree students, see also *Master's Degrees—Grade Requirements.*) When a student with this type of graduate standing has fulfilled the requirements for *classified or unclassified graduate standing,* it is his responsibility to request a new statement of standing from the Admissions Office.

350 1 2 5 470

MASTER'S DEGREES

To be eligible to receive the master's degree at Fresno State a student must have achieved a command of his field of specialization and must have demonstrated competence in independent investigation, analysis, and synthesis beyond the scope of individual courses. *The requirements listed in the following sections are minimums.* For details of specific curricula see the department statements and the *Graduate Bulletin.*

Applicants for all master's degrees gain admittance to graduate standing, construct their programs, and receive advancement to candidacy under standard college-wide policies. Most departments, however, impose additional requirements for admission to specific programs, advancement, and completion.

CLASSIFIED GRADUATE STANDING

A student who has been admitted to a State University or College campus College under the Unclassified Graduate requirement above may, upon application, be admitted to an authorized graduate degree curriculum if he satisfactorily meets the professional, personal, scholastic, and other standards for admission to the graduate degree curriculum, including qualifying examination, as the appropriate college authorities may prescribe.

A graduate student who expects to have his course work apply toward a master's degree should clearly indicate his master's degree objective on the application for graduate standing which he sends to the Admissions Office. As soon as his admission to the college has been processed, the Dean, School of Graduate Studies, will inform him of the procedures for obtaining admission to the degree program with *classified status.* Minimum criteria for *classified standing* include satisfactory undergraduate scholarship, including demonstrated potential for graduate work in the major field, satisfactory scores on the Graduate Record Examinations Aptitude Test (or Admission Test for Graduate Study in Business), and other criteria which the department may prescribe. For specific minimum acceptable scores consult the Office of the School of Graduate Studies.

Not more than 10 units (including transfer credit) completed before achieving classified standing at Fresno State may be applied to the master's degree program. Work taken during the semester of classification is considered to be completed in classified standing. In two-year programs the above limitation applies only to the last 30 units.

ADVANCEMENT TO CANDIDACY

Classified graduate standing gives a student permission to work toward qualifying for candidacy. Advancement to candidacy gives a student permission to proceed toward qualifying for the degree. At least 9 units must be completed after advancement. Requirements for advancement to candidacy include the following:

1. Classified graduate standing.
2. Completion of any additional prerequisites which the adviser specifies on the declaration of intent form.
3. Satisfactory completion of the Graduate Record Examination Advanced Test or departmental qualifying examination.
4. A minimum grade point average of 3.0 (both overall and at Fresno State) on all upper division and graduate course work from the date of embarking on the first course of the proposed master's degree program.
5. Satisfactory completion of the foreign language requirement for those programs having such a requirement. (See departmental Foreign Language Requirement.) In making this recommendation, the department takes into account professional and personal standards as well as scholastic achievement as revealed by grades and performance on examinations. The student is responsible for ensuring that the adviser has sufficient information other than grades and scores on which to make this recommendation.
6. Departmental recommendation for advancement to candidacy on a petition form available in the School of Graduate Studies office. On this form the student, in consultation with his adviser, lists the coherent set of courses which will constitute his degree program when approved.
7. Completion at Fresno State of at least 9 units of the proposed program with a 3.0 average on all completed work appearing on the program.
8. Submission to the Office of the Dean, School of Graduate Studies, of the properly signed petition for advancement to candidacy.

PROGRAM REQUIREMENTS

(See Course Numbering System)

The program requirements for the master of arts and master of science degrees assume substantial undergraduate preparation in the field. See school and department statements in this catalog or in the *Graduate Bulletin* for particulars. A student lacking this preparation will find it necessary to exceed the minimum requirements indicated below. (Consult departments for MBA, MSW, and MCRP minima.) The approved degree program for the master's degree is a coherent pattern of (1) courses specified under *Requirements* for the degree in question listed in the Graduate Bulletin and (2) additional courses selected to meet the student's particular needs. It consists of at least 30 units completed after the bachelor's degree and within seven years just preceding the granting of the master's degree. Only graduate courses (200 series) and such upper division courses (100 series) as are recommended by the schools or departments and approved by the Graduate Council are acceptable on the unit requirement. Other courses are counted in calculating the student's study load, but cannot be counted toward the unit requirement for the master's degree. The total approved program must include the following:

1. At least 24 units of the program must be Fresno State residence credit, 6 units of which must have been taken on the Fresno campus prior to enrolling for the thesis or project or for a seminar alternative to the thesis.
2. Of the 30 units for the degree, not more than 6 units may consist of any combination of approved student teaching or extension courses. Student teaching credit is not ordinarily used on master's degree programs. In unusual circumstances, if student teaching is demonstrably appropriate to a program, up to 3 units of such work may be approved by the Graduate Council. Credit by examination may be used to fulfill prerequisites, but may not apply toward the 30 units. Extension credit is not regularly used on master's degree programs; special cases, however, may be ruled upon by the appropriate college authorities. Transfer extension and correspondence credit may be used toward a master's degree only if the institution offering the work would use it on a comparable master's degree program and if it is judged by appropriate college authorities to be particularly relevant to the individual student's program.
3. With approval of departmental graduate adviser, post-baccalaureate credit allowed for work taken in the semester or summer in which the baccalaureate degree is granted may be applied toward a master's degree, if it meets master's degree criteria in all respects. See *Post-Baccalaureate Credit.*
4. At least 15 units must be in courses designed primarily for master's degrees (numbered in the 200 series). Most programs require more than 15 units of 200 series course work.
5. At least 9 units must be completed after advancement to candidacy. Work taken during the semester or summer of advancement may apply on this requirement.
6. Appropriate course work from a field other than the major may be required at the discretion of the major department.
7. Appropriate provision must be made for a thesis, a project, or, when permitted, an alternative to the thesis, unless the department offers "Plan B" (nonthesis), in which case provisions must be made to conform to departmental requirements, including comprehensive examinations.
8. Students having a special interest that cannot be met within the stated requirements of a given master's degree program may, with written permission of appropriate college authorities, make further program adjustments to meet their needs. Consult the Dean, School of Graduate Studies.

It is the student's responsibility to complete the specific courses listed on his approved program. Once a program has been approved by the Graduate Council, it may be changed only on the written request of the student and his department or school adviser and with the approval of the Dean, School of Graduate Studies. Forms for requesting such program adjustment are available in the Office of the School of Graduate Studies.

THESIS, PROJECT, AND THESIS ALTERNATIVE

Most master's degree curricula at Fresno State require the preparation of a thesis or a project. A few departments permit thesis alternatives. (See *Graduate Bulletin* for definition and standards of thesis, project, and thesis alternative and instructions for microfilming.)

1. To be eligible to enroll for thesis or project (299), or for a thesis alternative, a student

must have
(a) been advanced to candidacy for the master's degree.
(b) maintained a B (3.0) average on his approved program.
(c) completed at least six units of his approved program on the Fresno campus.
(d) completed any course in research techniques required by his major department.
(e) secured a thesis committee, consisting of a chairman and at least two other members.
(f) secured approval of his thesis plan from the division or department graduate committee and filed in the Office of the Dean, School of Graduate Studies, an official thesis committee assignment.

If it is impossible to meet one or more of these requirements before the semester or summer session of thesis registration, the student must submit to the Office of the School of Graduate Studies, prior to the close of late registration, a recommendation from the department that special permission to register for thesis be granted.

2. Registration for thesis requires authorization by the Dean, School of Graduate Studies, and may be processed during the first two weeks of any semester after the requirements listed in (a) through (f) above have been met or special permission for exceptions has been granted. If, however, a student fails to enroll within one semester (excluding summer sessions) after his official acceptance by a thesis committee, the committee is dissolved and a new committee must be appointed before registration can be processed. A student planning to register for thesis after a break in regular session attendance must be readmitted to the college. (See *General Information—Registration.)*
3. A student whose thesis is planned to extend over more than the semester in which he first enrolls in 299 may receive an In Progress (IP) grade. If at the end of one full year after the recording of the IP grade the thesis has not been completed, the thesis committee and the library are relieved of any further thesis obligation to the student. The student must re-enroll and apply for a new committee in each subsequent semester or summer session during which he uses the library or draws on faculty time in connection with his thesis. The new committee will not necessarily be composed of the same personnel and is not necessarily bound by the decisions of the former committee. Since a continuing IP grade does not represent enrollment, reregistration may require readmission to the college. (See *General Information—Registration.*)
4. The student and his thesis chairman should set a deadline for the completion of the semifinal draft, no later than four weeks before the last day of scheduled final examinations. This date should be early enough so that the chairman and the other members of the committee can clear the draft before the student must meet the deadline for clearance by the Dean of the School of Graduate Studies.
5. Before a thesis is officially accepted by the graduate school, it must meet Graduate School criteria on matters of format, documentation, and quality of writing. The semifinal draft, initialed by the thesis chairman as acceptable with technical corrections should be submitted to the Office of the Dean of the School of Graduate Studies at least three weeks before the last day of scheduled final examinations. This deadline has been set as late as possible in the semester to accommodate the student; late manuscripts will not be accepted until the following semester or summer session. Students are urged to follow meticulously *Specifications and Instructions for the Master's Thesis or Project;* copies are available in the Office of the School of Graduate Studies.
6. Four copies (three to be retained by the college) signed by the thesis chairman and ready for binding, together with the school or departmental clearance must be submitted to the Office of the School of Graduate Studies, no later than one week before the last day of scheduled final examinations. A fee for binding is due and payable at the Fresno State College Association Office on the date of final submission. A student who wishes to retain more than one bound copy may arrange for the extra binding by paying an additional fee.
7. A student may arrange to have his thesis published in microfilm form, with an abstract of the thesis published in the quarterly periodical, *Masters Abstracts.* This form of publication is encouraged by the college. Further details of the microfilming and copyright procedure may be obtained from the Office of the School of Graduate Studies.

REQUEST THAT MASTER'S DEGREE BE GRANTED

A request that the master's degree be granted must be filed in the Student Records Office and the diploma fee must be paid in the first two weeks of a semester or first week of a summer session in which the work is to be completed. (See Academic Calendar, Schedule of Courses, and Fees and Expenses.) Application forms are available in the Student Records and Graduate Studies Offices. Diplomas for those completing degree requirements during summer sessions and at midyear will be awarded at the following June Commencement.

Failure to complete requirements for the degree during the semester of the application necessitates the filing of a new application for the semester of actual completion. Such reapplication is subject to the same time schedule as is the original application; however, there is no additional diploma fee.

FOREIGN LANGUAGE REQUIREMENT

Fresno State College does not have a general foreign language requirement for the master's degree. Some master's degree majors do, however, require competence in an appropriate foreign language as a consideration for advancement to candidacy. (See departmental *Foreign Language Requirement* and department requirements.) Students who contemplate graduate study beyond the master's degree are urged also to investigate foreign language requirements in the institution in which they anticipate advanced graduate study.

MAXIMUM STUDY LOAD

Graduate courses require substantially more concentrated study than do under-graduate courses. A normal load is from 9 to 12 units and the maximum allowable load is 16 units for full-time master's degree students when one or more courses in the 200 series are included. Students employed full time may take a maximum of 6 units. For maximum units for summer session see the *Summer Session Bulletin.*

GRADE REQUIREMENTS

All graduate students will be held to the scholarship standards listed under *General Information.*

No course with a grade below C may apply on a master's degree approved program.

To be eligible for advancement to candidacy, a student must have earned a B average (both overall and at Fresno State) on all upper division and graduate course work completed after the date of embarking on the first course to be included in the master's degree program.

To be eligible for enrollment in the thesis or project or in an alternative to the thesis, a student must have been advanced to candidacy and must have maintained a B average on his approved program.

To be eligible for the granting of the degree, a student must have maintained a B average on his complete approved program. Any grade earned in a course on the approved program continues to figure in the grade-point average, even if that course is for any reason later dropped from the program.

To be eligible to receive the master's degree *with distinction* a student must have earned a 3.9 grade-point average on the approved program for the master's degree or on all upper division and graduate work subsequent to the bachelor's degree. He must also have the approval of his department.

EXAMINATIONS

The Graduate Record Examination Aptitude Test (or the Admission Test for Graduate Study in Business) is required for classified standing. The appropriate test should be taken early enough for scores to reach the Fresno State Test Office in time for inclusion in documents used to determine admissibility to a program. The School of Business will not consider a student whose ATGSB scores are not in hand. Other fields will occasionally permit taking the aptitude test during the first semester. A satisfactory score in The Graduate Record Examinations Advanced Test in the student's major field (or a departmental qualifying examination) is required for advancement to candidacy.

In addition to the qualifying examinations required for advancement to candidacy for the master's degree, all departments reserve the right to require written or oral comprehensive examinations when circumstances demand. A few departments require final comprehensive

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examinations of all their students. Candidates are urged to consult the chairman of the department or school graduate committee or the Dean, School of Graduate Studies, about examination requirements.

EXTENSION OF TIME

A period of seven years is allowed for the completion of all requirements for the degree. A student whose program has been interrupted by military service should consult the Dean of the School of Graduate Studies about provisions for military extensions. Otherwise, time may be extended only by the substitution of recent courses for outdated ones or by the passing of comprehensive examinations in the relevant courses or subject field.

FINANCIAL ASSISTANCE

A limited number of graduate assistantships and other types of financial assistance are available to graduate students. Write to the School of Graduate Studies, for information and application forms.

INTERNATIONAL (FOREIGN) GRADUATE STUDENTS

Fully qualified graduate students coming to Fresno State with the ultimate goal of a master's degree should allow approximately two years for accomplishing a 30-unit program, more for a two-year professional degree. Graduate students regularly devote most of their time to studies in their major field; however during the first semester at Fresno State, foreign students whose native language is not English and who are studying in this country for the first time, are required to enroll in International Studies-Campus 293 and appropriate work in English as a foreign language. International Studies-Campus 295 is required during the last semester or at any time after half the work of the master's degree has been completed. Both courses apply toward degrees. For further information, see *International Programs—Graduate Courses.*

Depending on the quality of his work in the first semester and his ultimate purpose, the foreign graduate student may at the end of the first semester continue in one of the following directions: (1) If he has chosen a new field or if his undergraduate work was not equivalent to a Fresno State bachelor's degree, he may petition to complete bachelor's degree requirements. (2) If he wishes to select only those courses which have greatest value for him, regardless of degree requirements, he may follow an individually planned and approved sequence of courses leading to a Certificate of Attendance. (3) If his first semester's work gives evidence of probable success in master's degree study, he may seek admission to a master's degree program. Whichever alternative the student from abroad selects, appropriate course work taken during the first semester may be accepted for credit toward this goal.

ADMISSION

Graduate students from abroad follow the same procedures as all other graduate students except that, the Test of English as a Foreign Language (TOEFL) is required of all students whose native language is not English. Exception may be made for students transferring from American colleges and universities with grades that demonstrate full competency in English. TOEFL scores, applications, and academic documents should reach the Fresno State Admissions Office at least six months before the semester for which admission is desired. TOEFL is administered at various centers throughout the world. For further information, write to the School of Graduate Studies.

Graduate students with a total score of less than 500 on TOEFL will not ordinarily be admitted to graduate study at Fresno State. Exception may be made for students who are otherwise admissible and who satisfactorily complete an approved intensive program in English as a foreign language. The college cannot, however, commit itself until the work has been completed and acceptable scores earned on a retake of TOEFL.

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SCHOOL OF AGRICULTURAL SCIENCES

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SCHOOL OF AGRICULTURAL SCIENCES

O. J. Burger, Dean

Assistant Dean ..... George F. Ilg

Department	*Chairman*
Agricultural Economics	Thomas I. Gunn
Agricultural Industry and Education	Richard Norton
Animal Science	Jesse T. Bell
Plant Science	Harry P. Karle

The School of Agricultural Sciences provides degree curricula preparatory to professions and occupations in agriculturally related industries. The college farm is organized and operated to provide experience and practical training. Eleven hundred and ninety acres serve as a laboratory and production unit where students carry on supervised farming programs in animal and plant science. In addition, livestock, vineyards, orchards, and crop land are maintained for laboratory use. For information on supervised projects see *Animal and Plant Science Departments.*

The school offers programs leading to the bachelor of science degree in three specialized majors: Agricultural Business, Agricultural Education, and Agricultural Science; an agriculture minor; short courses for those not enrolled in the college program but engaged in farming or allied occupations.

Students desiring to qualify for teaching credentials should consult the Dean of the School of Agricultural Sciences or credential advisers. For credential structure, see *School of Education.*

The master of science degree in agriculture with concentrations in animal science and plant science was authorized on May 5, 1967. See the *Graduate Bulletin.*

CAREER PLANNING

Listed below are a few of the many fields of study in which a student may be interested. He should consult the appropriate department to select an adviser for his field of interest, who will assist him in the preparation of his program of study under one of the three majors for the bachelor of science degree. (See *Individual Counseling.*)

Field of Interest	*Department*
Farm Labor Agricultural economics Farm management Agribusiness Marketing and sales	Agricultural Economics
Dairy industry, manufacturing Mechanized agriculture Enology, wine technology Food science, food processing Agricultural education	Agricultural Industry and Education
Animal husbandry Dairy husbandry Poultry husbandry Horse husbandry Animal nutrition Preveterinarian Meat technology, meat science	Animal Science
Agronomy, field crops Horticulture Ornamental horticulture Natural resources Agricultural inspection and services Viticulture Floriculture Soil science Vegetable crops	Plant Science
Environmental sciences General agriculture, diversified farming Agricultural science	All Departments
Agricultural journalism Agricultural chemistry	All Departments except Agricultural Economics

INDIVIDUAL COUNSELING

The School of Agricultural Sciences offers, within the framework of one of the three major programs, an individually designed program of study to prepare the student for his specific career objective. Flexibility is an important characteristic of the programs. Advisers will assist the students in evaluating the alternatives this flexibility allows. They can and do play a significant role in planning the educational programs because of their close personal contact with students and with potential employers.

Departmental advisers are competent in guiding the selection of courses necessary to prepare a student for his individual career objective. Each student possesses specific and unique characteristics and objectives which will be taken into consideration in program planning.

Each student must consult his adviser at least once a semester. Prior to completion of 90 units, each student shall, in consultation with his adviser, develop an official *Program of Study*. This official program, when approved by the adviser, department chairman, and school dean, must be filed with the registrar upon completion of 90 units.

HIGH SCHOOL AND COMMUNITY COLLEGE PREPARATION

To assure the most rapid progress through a major program, high school and community college preparation should include the following:

Fundamental courses in agricultural sciences.
Biological sciences, such as botany and zoology.
Physical sciences, such as chemistry through organic chemistry.
American history and government.
Communication skills.
Mathematics through college algebra.

BACHELOR OF SCIENCE DEGREE

The bachelor of science degree in agricultural sciences is granted upon completion of a four-year curriculum consisting of 128 semester units, *including 40 units upper division*, selected within the framework of one of the three major programs. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*).

AGRICULTURAL BUSINESS MAJOR FOR THE BS DEGREE

The agricultural business major prepares students for employment in management positions in farming or businesses related to agriculture. Programs of study are available for students seeking careers in agribusiness (management of businesses related to agriculture), marketing of agriculture products, farm management, and agricultural economics. Under this major a student may elect various routes through a combination of subject matter in agricultural economics, plant science, animal science, mechanized agriculture, food science, and other specialized agricultural fields.

	Units
General education (may include additional requirements)	40
Special course requirements (US History, US Constitution, and physical education)	(10)
Major requirements (including 20 units upper division)	60
Select one course in four of the following six disciplines (12 units):	
Plant science, animal science, food science, soil science, mechanized agriculture, agricultural economics.	
Approved electives in agricultural sciences, business, economics, and/or mathematics (48 units)	
Electives and additional requirements	18–28
(At least 40 units upper division)	128

Additional Requirements: Each student is required to complete certain courses in biological and physical sciences, mathematics, and related subject matter. Consult departmental adviser.

AGRICULTURAL SCIENCE MAJOR FOR THE BS DEGREE

The Agricultural Science major, with its flexible design, will afford the student an opportunity to acquire the necessary background for a wide variety of career objectives in agricultural industry and professional or graduate study.

Option I provides an opportunity for the students to pursue careers in, but not limited to, dairy industry, food science, enology, animal science, dairy science, poultry science, plant science, agronomy, horticulture, ornamental horticulture, viticulture, or mechanized agriculture.

Option II provides the necessary background in mathematics, chemistry, physics, and modern concepts of biology in preparation for professional or graduate study, including veterinary medicine.

	Units
General education (may include additional requirements)	40
Special course requirements (US History, US Constitution, physical education	(10)
Major: Option I (including 20 units upper division)	45
Select one course in four of the following six disciplines (12 units): Animal science, plant science, food science, soil science, mechanized agriculture, agricultural economics.	
Approved electives in agricultural sciences or related disciplines (33 units)	
Major: Option II (including 20 units upper division)	60
Approved electives in agricultural sciences or related disciplines (30 units)	
Approved electives in biological and physical sciences, mathematics through elementary analysis (calculus) (30 units)	
Electives and additional requirements	18–43
(At least 40 units upper division)	128

Additional Requirements: Each student is required to complete certain courses in biological and physical sciences, mathematics, and related subject matter. Consult departmental adviser.

AGRICULTURAL EDUCATION MAJOR FOR THE BS DEGREE

The Agricultural Education major is designed to assist students who wish to pursue a teaching credential. The program provides students with the opportunity to become qualified to teach in the broad field of vocational agriculture. They may become especially prepared to teach in agricultural production, mechanized agriculture, and areas of both plant and animal sciences as well as food science. Moreover this program will help prepare the graduate for a wide spectrum of career opportunities in the industry of agriculture. Within the major the student may pursue areas of concentration such as animal husbandry, agronomy, general agriculture, mechanized agriculture, dairy science, horticulture, viticulture, enology, food science, and agricultural inspection and services.

	Units
General education (may include additional requirements)	40
Special course requirements (US History, US Constitution, physical education)	(10)
Major (including 20 units upper division)	49
Electives in: animal science (15 units), plant science (15 units), soil science (3 units), mechanized agriculture (10 units), agricultural economics (6 units)	
Electives and additional requirements	29–39
(At least 40 units upper division)	128

Additional Requirements: Each student is required to complete certain courses in biological and physical sciences, mathematics, and related subject matter. Consult departmental adviser.

MINOR

A minor in agriculture is available to degree students in other departments and may be selected in consultation with departmental advisers. The minor consists of 20 units of which 12 are upper division.

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

PREVETERINARY PROGRAM

Students planning to attend a school of veterinary medicine may satisfy the first two years of the program at Fresno State. The School of Agricultural Sciences is equipped to provide valuable experience with large animals through the student project program. Students desiring further information regarding the preveterinary curriculum should consult the Chairman of the Animal Science Department.

MASTER OF SCIENCE DEGREE

The master of science degree in agriculture is designed to extend competence for agricultural research, agricultural field work, and the teaching of agriculture, and to provide the first graduate degree for students anticipating advanced graduate study in animal or plant sciences. For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* A Sci 10, Plant 30. *Area II:* Agri 161, Ag Ec 31. *Area V:* A Sci 70, D Ind 23, Enol 15, F Sci 1, Plant 10, 15, 16, 21, 25, 40, 55, 65.

GRADUATE COURSES (Agri)

(See *Course Numbering System–Definitions and Eligibility*)

200. Experimental Methods (3)
Prerequisite: Math 40 or equivalent; permission of instructor. Principles of research emphasizing statistical procedures, collection of data, summarization and publication of results. Design, conduct, and analysis of experiments in agriculture.

210T. Topics in Agricultural Economics (3; max total 15)
Prerequisite: upper division agricultural economics courses appropriate to study topic; permission of instructor. Agricultural marketing, farm management and production analysis, price, credit, and land economics study areas.

219. Seminar in Agricultural Economics (1–4; max total 4)
Prerequisite: permission of instructor. Written and oral reports in recent literature and problems related to agricultural economics.

220. Readings in Agriculture (2–3)
Prerequisite: permission of instructor. Individually directed readings in a field of special concern to the student's graduate program; appropriate reports and evaluation required.

221T. Topics in Food Science (3; max total 12)
Prerequisite: upper division food science course appropriate to study topic, permission of instructor. Advanced studies in a given area: food preservation; processing effect on chemical components; flavor, texture, and other quality factors in foods.

229. Seminar in Food Science (1; max total 4)
Prerequisite: permission of instructor. Investigation of current research and problems related to food science. Oral and written reports.

240T. Topics in Animal Science (3; max total 12)
Prerequisite: upper division animal science appropriate to study topic; permission of instructor. Investigation of topic in animal science: anatomy, physiology, pathology, nutrition, genetics, or economics.

241. Endocrine and Reproductive Physiology (3)
Prerequisite: Chem 8. Physiology which deals with neural and hormonal integration and control of the animal body, including scientific aspects of the processes of reproduction and application of current knowledge in improving reproductive efficiency.

242. Environmental Physiology of Domestic Animals (3)
Prerequisite: A Sci 110, 155; Chem 2A; permission of instructor. A study of environmental factors affecting domestic animals under field and controlled conditions.

243. Metabolism and Energy Physiology (3)
Prerequisite: Chem 8. Current aspects of the integral processes involved in metabolism and energy physiology of laboratory and farm animals. Application of the principles concerned in intermediary metabolism. Selected readings in the current literature within the field.

244. Vitamin and Mineral Nutrition (3)
Prerequisite: A Sci 70. A survey of the biochemical and physiological importance of vitamins and minerals in the nutrition of man and his animals. Included is the diagnosis, prevention and treatment of both vitamin and mineral deficiencies.

245. Advanced Animal Breeding (3)
Prerequisite: A Sci 110, 155; Chem 2A; permission of instructor. The application of genetic principles to the breeding of livestock and poultry. The study of applied selection and measurements of the results.

250T. Topics in Plant Science (3; max total 12)
Prerequisite: upper division plant science appropriate to study topic, permission of instructor. Advanced studies in a given area: crop physiology, plant breeding, plant pathology, plant nutrition, or economics.

251. Pesticides (3)
Prerequisite: Bot 10, Chem 8. Modes of action of pesticides. Absorption and translocation of pesticides. Mechanisms of pesticide specificity. Interaction with soil and soil microbes. Methods of pesticide investigations (biological assay, instrumental detection, chemical assay, chemical and microbial degradation). (2 lecture, 3 lab hours)

252. Plant Nutrition (3)
Prerequisite: Bot 104. Mineral requirements of plants; the acquisition and translocation of nutrients by higher plants and the role of nutrient elements in plant development. (2 lecture, 3 lab hours)

255. Advanced Plant Breeding (3)
Prerequisite: Plant 140. Principles and techniques of plant improvement, breeding methods, combining ability, sterility systems, quantitative genetic analysis, heritability estimates, experimental designs for plant breeding.

256. Plant-Water Relationships (3)
Prerequisite: Bot 104. Physicochemical properties of water and solutions; movement of water, solutes, and growth regulators in plants; study of moisture-sensitive periods of various crops; factors affecting water absorption and retention.

257. Physiology of Cultivated Crops (3) (Former Ag 250.7)
Plant cell structure and function. Response of cultivated plants to the environment. Physiology and hormonal control of flower induction, fruit set, and development. Review of pertinent current publications.

258. Plant Disease Control (3)
Prerequisite: Plant 171. Principles of plant disease control; agricultural chemicals used in plant disease control. Methods and theory used in application of chemicals, biological control, and breeding for resistance. Insight into industrial research and development of control measures. (2 lecture, 3 lab hours)

260. Seminar in Animal Science (1; max total 4)
Prerequisite: permission of instructor. Written and oral reports on selected areas of research on problems in animal science.

270. Seminar in Plant Science (1; max total 4)
Prerequisite: permission of instructor. Reviews and reports on recent literature and problems in agronomy, horticulture, irrigation, soils, ornamental horticulture, or viticulture and enology.

280. Seminar in Agriculture (1–3; max see below)
Maximum total credit 9 units in any given area or any combination of the three areas. Prerequisite: bachelor's degree in agriculture or permission of instructor. Advanced problems in agriculture; research and experimentation in a selected area: animal science, plant science, or agricultural mechanics.

281. Problems in Agricultural Education (1–3; max total 3)
Prerequisite: graduate standing. Individual supervised research in agricultural education; appropriate reports and evaluation required. Individual conferences.

287. Organization, Administration, and Supervision of Agricultural Education (3)
Prerequisite: graduate standing. A study of the California and federal plans for vocational education as they pertain to agricultural education. The VEA Act of 1968 and the preparation of district plans.

289. Adult and Continuation Education in Agriculture (3) (Former Ag Ed 189)
Prerequisite: graduate standing or permission of instructor. History, philosophy, organization, administration, and development of teaching rural and urban adult education programs in agricultural mechanics and agricultural sciences.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299. Thesis (2–6; max total 6)
Prerequisite: see *Master's Degrees-Thesis Requirements.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

AGRICULTURAL ECONOMICS DEPARTMENT

Professors: Gunn (Chairman), Glim
Associate Professor: Hagen

The Department of Agricultural Economics offers programs of study in, *but not limited to,* agricultural business, farm management, and agricultural economics within the framework of the agricultural business major. Students may prepare for positions in agricultural marketing, farm management and the management of businesses related to agriculture.

Students majoring in agricultural business may follow various educational routes in pursuing their areas of interest (plant science, animal science, mechanized agriculture, food science, enology, and other specialized fields) or they may prepare for a career as professional agricultural economist.

Programs of Study: The department provides competent advisers for students pursuing career objectives in, *but not limited to,* the following areas:

Career Objective	*Suggested Major*
Farm management: animal science, plant science	Agricultural business
Agricultural economics	Agricultural business or agricultural science
Agribusiness management	Agricultural business
Production economics: animal science, plant science	Agricultural business
Agricultural law	Agricultural business or agricultural science
Agricultural marketing	Agricultural business
Agricultural sales: animal science, plant science	Agricultural business
Agricultural sales: mechanized agriculture, food science, agricultural chemicals, animal pharmaceuticals	Agricultural business or agricultural science

Suggested Courses: The following core of courses is recommended for all students majoring in agricultural business: Ag Ec 41, 112, 167, 170, 172, 179; B A 18, QM 60; electives from B A 115, 118, or 119; Acct 3 or 4A. Students planning for graduate study in this area are encouraged to select additional electives in economic theory, statistics, and mathematics.

COURSES

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

AGRICULTURAL ECONOMICS (Ag Ec)

31. Agricultural Economics (3) (Former Ag 31)
Not open to students with credit in Econ 1A or B. Agricultural and nonagricultural economic development; nature of production, marketing, and consumption of food; basic tools of economic analysis.

41. Agricultural Business Statistics (3)
Prerequisite: Math 29 or equivalent. Measures of central tendencies and dispersion, time series analysis, index numbers, seasonal variation, data collection and presentation, introduction to probability theory, and discrete and continuous probability distributions.

80. Undergraduate Research (1–4; max total 4)
Open to freshmen or sophomores with permission of instructor. Directed study or research on particular problems in the field of agricultural economics.

112. Farm Management (3) (Former Ag 112)
Prerequisite: Ag Ec 31 or equivalent. Basic economic principles relating to farm management; organizing the farm, managing crop and livestock enterprises; farm business administration. (2 lecture, 3 lab hours)

151. Farm Accounting (3) (Former Ag 151)
Prerequisite: Ag Ec 31 or equivalent. Farm accounting systems, farm records, budgets, income tax returns. (2 lecture, 3 lab hours)

160. Marketing Institutions (2)
Business and economic functions performed by various specialized marketing agencies with emphasis on physical operating patterns. Local field trips to marketing firms and workshops with agribusiness managers. (1 lecture, 2 lab hours)

165. Agricultural Labor Management (3)
Prerequisite: Ag Ec 31 or equivalent. Farm labor laws, procedures and practices in managing farm labor; collective bargaining activities; labor relations; solving labor-management disputes.

167. Agribusiness Management (3)
Prerequisite: Ag Ec 31 or equivalent. Management of businesses related to agriculture, including, for example, farmer cooperatives, feed-seed-fertilizer suppliers, food processors, equipment dealers, and marketing firms; application of management principles and problem solving in agribusiness firms.

170. Agricultural Economics Analysis (3) (Former Bus Ad 170)
Prerequisite: Econ 1A-B. Development of analytical tools for use in solving agricultural economic problems; research methods in agricultural business.

171. Natural Resources Economics (3) (Former Bus Ad 171)
Prerequisite: Econ 1A-B. Problems of our natural resources—land, water, minerals; policies and programs relating to natural resource development; population influences.

172. Marketing of Agricultural Products (3) (Former Bus Ad 172)
Prerequisite: Ag Ec 31 or equivalent. Basic marketing functions, policies, and problems involved in handling agricultural products; economic concepts, business decisions, and practical applications.

173. Agricultural Business Internship (3)
Experience in a business related to agriculture or in a farm operation. Assignment to a training program under the supervision of the instructor and a representative from an outside firm during the academic year or summer.

177. Agricultural Finance (3) (Former Bus Ad 177)
Prerequisite: Ag Ec 31 or equivalent. Analysis of agricultural credit problems; acquisition and management of capital; financing the farm business enterprise; farm appraisal.

179. Agricultural Policy (3) (Former Bus Ad 179)
Prerequisite: Econ 1A-B. Governmental policies and programs affecting the economic position of agriculture; evaluation of specific programs which influence agricultural production, marketing, prices, income, and financial aids.

180. Undergraduate Research (1–4; max total 4)
Open to juniors or seniors with permission of instructor. Directed study or research on particular problems in the field of agricultural economics.

185T. Current Topics in Agricultural Business (1–4; max total 4)
Prerequisite: junior standing. Agricultural economics, marketing, sales and communication, policy, agribusiness, and farm management.

AGRICULTURAL INDUSTRY AND EDUCATION DEPARTMENT

Professors: Ball, Dowler, G. Ilg, F. Nury

Associate Professors: From, H. Martin, Pflueger

Assistant Professor: Norton (Chairman), Kim

Part-time: Albert Johnson, Pangborn, Richert, C. Simmons

The Department of Agricultural Industry and Education offers a wide variety of educational opportunities including programs of study in agricultural education, mechanized agriculture, food science, dairy industry, and enology.

The department provides faculty to counsel students who wish to pursue programs emphasizing teacher education, food science and technology, dairy manufacturing, mechanized agriculture, and wine making. The courses offered in the disciplinary areas listed below provide the necessary background to prepare students for career objectives.

Mechanized Agriculture (Ag Me) prepares students for positions in farm equipment development, sales and service, rural electrification, farm building construction, and general farming. The courses deal with the ever-changing field of agricultural processes and mechanization.

Agricultural Education (Ag Ed) prepares students as teachers of agriculture for the public school grades 7 through 14.

Dairy Industry (D Ind) prepares students for positions in the dairy and food processing industry with in-depth subject matter in production, marketing, government inspection, and food technology.

Food Science (F Sci) prepares students for employment opportunities with governmental agencies engaged in regulatory work; food industry including food processing, canning, freezing, and packaging plants; and research.

Enology (Enol) prepares students for positions in the California wine industry. Typical positions include laboratory technologist, plant sanitarian, wine chemist, processing department supervisor, and production manager.

Programs of Study: The Department of Agricultural Industry and Education provides competent advisers for students pursuing career objectives in, *but not limited to,* the following areas:

Career Objective	*Suggested Major*
Farm equipment sales and service	Agricultural business
Agricultural engineering	Agricultural science
Dairy industry technology	Agricultural science
Teaching: vocational agriculture, junior high school, community college, college or university	Agricultural education
Food technology, food processing	Agricultural science
Enology, wine technology	Agricultural science
Wine chemistry, food chemistry	Agricultural science
Food plant management	Agricultural business
Agricultural sales: food products, farm equipment	Agricultural business
General farming or ranching	Agricultural education or agricultural science
Food and dairy sanitation	Agricultural science
Agricultural research: food products, agricultural by-products	Agricultural science

Laboratory Units: Theoretical instruction in dairy industry, enology, and mechanized agriculture is enhanced through practical application at the various laboratory units.

Dairy Processing Laboratory: A pilot plant with cold storage and dairy processing facilities affords students an opportunity to learn practical and management skills involved in making ice cream, cheese, butter, and other dairy by-products.

Enology Laboratory: The pilot winery affords the student an opportunity to learn practical skills involved in winemaking, bottling, and storage of wines and is also used as a laboratory for certain phases of the food science program.

Agricultural Mechanization Laboratory: This laboratory, complimented by the entire farm

laboratory, provides students with practical and theoretical experiences in modern farm power units and tillage and harvest machinery. It includes facilities for hydraulic power, rural electrification, maintenace, development, and fabrication of agricultural machinery, structures, and food processing equipment.

COURSES

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

AGRICULTURE (Agri)

10. Dimensions in Agriculture (1)
Survey of current social and economic developments and employment opportunities in modern agriculture and related agribusiness areas. Individual career planning.

27. Agribusiness Mathematics (3)
Not open to students with credit in B A 21 or Q M 21A–B or Math 29, or equivalent. Fundamental operations, percentage and interest, bank account reconciliation, equations, ratio and proportion, averages, areas and volumes, square root, measurement systems; applications to milk mixtures, fields, rations, tanks, silos, soils, lumber, concrete, personal buying and loans.

80. Undergraduate Research (1–4; max total 4)
Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in agricultural education, agricultural mechanics, dairy industry, enology, or food science.

160T. Topics in Agriculture (1–4; max total 6 per discipline if no topic repeated)
Prerequisite: junior standing, permission of instructor. Agricultural education, mechanized agriculture, food science, dairy industry, enology.

161. International Agriculture (3)
Prerequisite: junior or senior standing or permission of instructor. Economic and technological aspects of agricultural production and distribution in developing countries.

170. Seminar in Foreign Agriculture (3)
Prerequisite: Ag Ec 31, Agri 161 and permission of instructor. Written and oral presentation of researched topics on recent developments in foreign agriculture.

180. Undergraduate Research (1–4; max total 4)
Open to juniors or seniors with permission of instructor. Exploratory work on a suitable agricultural problem in agricultural education, agricultural mechanics, dairy industry, enology, or food science.

190. Independent Study (1–3; max see reference)
See *General Information*—Independent Study.

AGRICULTURAL EDUCATION (Ag Ed)

135. Introduction to Agricultural Education (3)
Survey of agricultural education; vocational surveys; occupational analysis; relationship of agriculture to occupational opporunities; qualifications for teaching agriculture. Includes field trips to high school vocational agriculture departments.

186. Methods of Teaching Vocational Agriculture (3) (Former Ag 186)
Prerequisite: E Ed 105; S Ed 150 or permission of instructor. Philosophy and teaching techniques in general agriculture; organization of teaching materials; professional standards for teachers.

187. Vocational Education (2)
Prerequisite: Ag Ed 186. Philosophy and organization of vocational education; educational principles for agriculture.

188. Group Study in Agricultural Mechanics (2)
Agricultural mechanics in the vocational agriculture program; organization of course of study and implementation of program; demonstration and analysis of teaching techniques.

MECHANIZED AGRICULTURE (Ag Me)

15. Agricultural Mechanics (3)
Mechanical skills in field of agriculture; selection, care and use of common farm tools; projects of wood and metal in farm appliances. (2 lecture, 2 lab hours)

17. Farm Tractors (3)
Operation and maintenance of farm tractors; operation of farm tractor under field conditions; service, maintenance and minor repair of gas, diesel, and butane type engines of wheel and crawler type. (2 lecture, 2 lab hours; 5 hours field operation.)

18. Agricultural Welding (3)
Prerequisite: Ag Me 15 or permission of instructor. Metallurgy of mechanized agriculture. Arc and oxyacetylene welding, cutting and brazing process as tools of construction, maintenance and repair of the machines of modern agriculture. (2 lecture, 2 lab hours)

25. Agricultural Drafting (3)
May be taken concurrently with Ag Me 15. Use of drafting instruments, lettering, dimensioning, scale drawings and working drawings of projects in agricultural mechanics; elementary plan and perspective drawings of small buildings. (2 lecture, 2 lab hours)

81. Farm Structures and Equipment (3)
Prerequisite: Ag Me 15. Construction and repair of farm structures and equipment; farm carpentry and construction principles: engineering principles, codes; farmstead layouts and basic requirements of farm structures. (2 lecture, 2 lab hours)

91. Farm Surveying (3)
Prerequisite: sophomore standing or permission of instructor. Use of the steel tape, level, transit and compass; field problems in chaining distances, laying out building lines, profile leveling for irrigation ditches and drains, land leveling, and measuring land areas. (2 lecture, 2 lab hours)

111. Rural Electrification (2)
Prerequisite: junior standing. Fundamentals of alternating current, wiring practices, circuit layouts and problems, motor and branch circuit protection; safe use of electricity; wiring of farmstead.

111L. Rural Electrification Laboratory (1)
Laboratory experiments to accompany Ag Me 111. (3 lab hours)

115. Farm Machinery (3)
Prerequisite: Ag Me 15. Study and operation of tillage tools, interaction of the soil and tool; cotton, grain, and specialized harvesting machinery and equipment. (2 lecture, 3 lab hours)

116. Farm Machinery (3)
Prerequisite: Ag Me 15. A study of farm machinery used in spring and summer operations. Orchard and field spraying equipment, field and row crop planters, cultivating tools, and haying machinery. (2 lecture, 3 lab hours)

121. Advanced Agricultural Welding (3)
Prerequisite: Ag Me 18. Arc and gas welding processes in construction and repair of farm equipment; inert arc welding; radiograph and shape burning; aluminum and stainless steels; welding tests and design of welded structures. (2 lecture, 3 lab hours)

131. Agricultural Fluid Power (2)
Prerequisite: junior standing or permission of instructor. Theory and practice in the operation, service, adjustment, and function of the component parts of fluid power systems. Design application of systems to farm machines. (1 lecture, 3 lab hours)

151A–B Farm Power (3–3)
Prerequisite: Ag Me 15. (A) Principles of the internal combustion engine; adjusting, servicing, and minor repairs practical in farming operations. (B) Overhauling and repairing of gasoline and diesel farm tractors and engines; field servicing and repairing of auxiliary power plants on farm machinery. (2 lecture, 3 lab hours)

153. Small Engines (3)
Prerequisite: junior or senior standing or permission of instructor. Theory of operation, maintenance and repair of small gasoline internal combusition engines, both 2-cycle and 4-cycle. (2 lecture, 3 lab hours)

158A–B. Unit Operations I and II (3–3)
Prerequisite: permission of instructor. Basic principles of plant operations in the food industry. Application of chemistry and physics to transformation of energy, heat transfer, flow of fluids, evaporation, heat exchange equipment, distillation, and drying. (2 lecture, 3 lab hours)

159. Pumps and Motors (3)
Prerequisite: Ag Me 15, Plant 50. Operation and study of centrifugal and deep well turbines; testing of pumps and motors under operating conditions to determine efficiency; installation, protective devices, maintenance and proper selection of single and three-phase motors used on the farm. (2 lecture, 3 lab hours)

DAIRY INDUSTRY (D Ind)

23. Dairy Foods and Man (3)
The history and geography, processes and processing of dairy products; their description, composition, and nutritive values; current role of the dairy industry and dairy foods.

53. Market Milk (3) (Former DS 53)
Prerequisite: A Sci 12 or permission of instructor. Principles of market milk production, processing, and distribution; modern processing methods and equipment. (2 lectures, 3 lab hours)

103. Manufacturing Dairy Products (3) (Former DS 111)
Prerequisite: junior standing or permission of instructor. Making common varieties of cheese, mix making and freezing desserts, churning butter, and culturing dairy products. (1 lecture, 6 lab hours)

113. Manufactured Dairy Products (3) (Former DS 112)
Prerequisite: D Ind 53 or 103, or permission of instructor. Chemistry, physics, and mathematics applicable to the production of butter, concentrated products, cheese, and ice cream.

133. Dairy Plant Management (3) (Former DS 154)
Prerequisite: D Ind 53. Principles, practices, and problems in management of modern dairy plants.

143. Marketing Milk Products (3) (Former DS 156)
Prerequisite: D Ind 53. Practices and principles of marketing and pricing dairy products.

153. Dairy Inspection (3) (Former DS 165)
Prerequisite: A Sci 12, D Ind 53. Application of the California Agricultural and the United States Public Health Codes to the inspection of dairies, dairy plants, and dairy products.

163. Dairy Chemistry and Testing (3) (Former DS 185)
Prerequisite: Chem 2A-B. Milk constituents and application of chemical laboratory tests as used in food plants. (2 lecture, 3 lab hours)

ENOLOGY (Enol)

15. Enology (3) (Former V 15)
History and development of the wine industry; mechanics of various processes and factors involved in wine making.

15L. Enology Laboratory (1)
Techniques in analyzing and evaluating wines; methods by which sound wines can be made and kept. Field trips to local wineries.

115. Wine Analysis and Production (5) (Former V 116)
Prerequisite: Chem 109, Enol 15, Micro 20 or 104, Plant 127. Principles and practices of preparation and analysis of dessert and table wines; operation of plant equipment; controlled tests. (3 lecture, 6 lab hours)

135. Field Studies (1)
Prerequisite: permission of instructor. A six-day field trip, during the Easter recess, covering the north coast wineries to study the techniques and handling methods employed by the many vintners.

165. Wine Technology (3) (Former V 160)
Prerequisite: permission of instructor. Technological study of winery equipment; evaluation, location, and operation; sanitation procedures. (2 lecture, 3 lab hours; 3- or 4-day field trip)

175. Winery Management (3) (Former V 171)
Prerequisite: permission of instructor. Physical properties of a winery; administrative organizational set-up; personnel; purchasing, packaging, and shipping; local, state, and federal regulatory statutes.

FOOD SCIENCE (F Sci)

1. Food Science and World Food Problems (3)
Modern food processing; world food problems; basic characteristics of processed foods.

100. Food Appraisal and Evaluation (3)
Prerequisite: Math 29, F Sci 1 or permission of instructor. Analysis, measurement, and methods used in evaluation of organoleptic, kinesthetic, and other quality factors in foods. (2 lecture, 3 lab hours)

110. Food Chemistry (3)
Prerequisite: Chem 8 (or concurrent), or permission of instructor. Composition, structure, and properties of food; chemistry of changes occurring during processing and utilization.

120A-B. Food Engineering (3–3)
Prerequisite: Phys 2A-B, physical chemistry, or permission of instructor. (A) Laws of thermodynamics, closed and open (control volume) systems; thermodynamic properties; thermodynamic cycles, phase, and chemical equilibria; gas dynamics. (B) Fluid flow, heat transfer, connection, radiation, heat exchangers. (2 lecture, 3 lab hours)

130. Food Analysis (3)
Prerequisite: 1 year of general chemistry, qualitative analysis. Principles of food analysis; sampling, separation, physical measurements, chemical and biochemical techniques. (2 lecture, 3 lab hours)

140A-B. Food Processing (3–3)
Prerequisite: F Sci 110; Chem 8 (or concurrent), or permission of instructor. (A) Food preservation by heat, low temperature, dehydration, fermentation, and radiation. (B) Sanitation and control of microbiological problems involved in processing and storing foods; case studies. (B: 2 lecture, 3 lab hours)

170. Food Microbiology I (3)
Prerequisite: Micro 20. Control of microorganisms in production and handling of foods; microbiological methods of examining foods.

171. Food Microbiology II (2)
Food spoilage organisms and microbiological methods of examining foods. (1 lecture, 3 lab hours)

191. Food Science Literature (1)
Prerequisite: senior standing. Review of recent literature.

ANIMAL SCIENCE DEPARTMENT

Professors: Bell (Chairman), Hixson, D. M. Nelson, Rousek, Selkirk
Associate Professors: Hoversland, D. D. Nelson
Assistant Professors: D. Davis, Dildey
Part-time: Geary, George, W. Smith

The Department of Animal Science offers programs of study in the animal sciences including beef, swine, sheep, horse, dairy, and poultry husbandry. The courses offered deal with the application of various principles of biological and physical sciences to animals. This includes management and production factors as related to environmental interrelationships, cultural modifications and adaptation, protection against pests and diseases, utilization, marketing, and research and development pertaining to the future. Students specializing in animal science may prepare for careers in business, government, foreign service, or the livestock industry where they may be engaged in consultation, management, production, research, teaching, advanced degrees, and other related professional services including veterinary medicine.

The courses offered in the disciplinary areas listed below provide the necessary background to prepare students for career objectives.

Animal Science (A Sci) provides in-depth study in subject areas designed to complement the livestock and poultry disciplines in preparing students for work opportunities in nutrition, reproduction, health, and related areas.

Animal Husbandry (A Sci) prepares students for positions in livestock production, management, and agricultural businesses where beef cattle, sheep, swine, and horse enterprises are an important part of the industry.

Dairy Husbandry (A Sci) trains students for commercial dairy farming enterprises, dairy herd management, milk quality control, field work for breeding associations, dairy sanitation, artificial breeding, and other agribusiness occupations.

Poultry Husbandry (A Sci) prepares students for occupations in commercial egg production, fryer operations, breeder flock management, hatchery management, processing, and sales positions with companies supplying the poultry industry. Graduates may operate their own turkey and poultry farms.

In addition, a selected variety of animal science and agricultural economics courses will provide the necessary background for the following career objective.

Animal Science-Agricultural Business. A combination of courses designed to train students in the important features of animal science and business.

Programs of Study: the Department of Animal Science provides competent advisers for students pursuing career objectives in, *but not limited to,* the following areas:

Career Objective	*Suggested Major*
Ranching	Agricultural science
Feed lot management	Agricultural business
Animal research	Agricultural science
Veterinary medicine	Agricultural science
Agricultural sales: feed, pharmaceuticals	Agricultural business or agricultural science
Dairy herd management	Agricultural business or agricultural science
Breeder, or field work with breed associations	Agricultural business or agricultural science
Foreign service in animal sciences	Agricultural science
Poultry management	Agricultural science or agricultural business
Animal nutrition: feed processing, research	Agricultural science
Meat technology: consumer products	Agricultural science or agricultural business
Artificial insemination: breeder, research	Agricultural science
Livestock judging, fair associations	Agricultural science or agricultural

business

Animal Science Laboratory Units: Theoretical instruction in animal sciences is enhanced through practical application at the various laboratory units.

Animal Husbandry Laboratories: The department operates breeding programs with Hereford and Angus beef cattle, a purebred flock of Rambouillet, Columbia, and Hampshire sheep, four breeds of swine, Berkshire, Hampshire, Yorkshire, and Duroc, and a herd of registered quarter horses. Feeding facilities are available at the livestock units for commercial feeding and research projects.

Dairy Husbandry Laboratory: The department maintains three breeds of purebred dairy cattle—Holsteins, Guernseys, and Jerseys. A Grade A dairy barn, dry feed lots, bull barn, fitting and showing barn, and a cow and calf barn provide excellent facilities for practical and specialized scientific training in dairy husbandry.

Poultry Husbandry Laboratory: Includes a central hatchery with cold storage facilities for egg handling, grading and candling; commercial egg production and pedigree pens; brooding facilities for conventional type houses and wire floor cage houses; and poultry processing facilities. Game birds, waterfowl, pigeons, and rabbits are maintained for laboratory work.

Meats Laboratory: The abattoir serves as a fully equipped meats laboratory including a killing room, meat cutting facilities, meat smoker, and freezing and cold storage facilities.

Veterinary Laboratory: The department maintains a veterinary hospital, including holding pens, for practical training in animal health care.

Feed Mill Laboratory: The department maintains a feed mill, including modern pelleting and mixing facilities, for practical training in feed mill operation and management. Feed grains and hay grown and harvested as a part of the instructional program in plant science are processed in the feed mill laboratory and delivered for feeding at the various animal units.

SUPERVISED PROJECTS

The agricultural sciences program is unique in that it provides opportunity for students to gain both theoretical training and practical experience in farming while pursuing their college programs. The supervised project experience is designed to supplement the lecture and laboratory assignments, giving students greater opportunity to develop the practical side of farming. The college owns all of the necessary equipment for student projects. A rental fee is charged for use of equipment. Proficiency in operating equipment must be demonstrated before projects may be undertaken. Students sign contracts wherein they agree to perform the labor required in caring for their projects. The Agricultural Foundation serves as a banking agency in providing the money a student will or may need for project materials. Students must submit records on each enterprise to the Agricultural Foundation and share the profit or loss with the Foundation according to established percentages.

In the Animal Science Department, students may feed out steers, lambs, pigs, fryers or turkeys, or have commercial egg production projects. Animal science students may, with prior approval of the department, engage in self-financed projects.

COURSES

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

ANIMAL SCIENCE (A Sci)

10. Animal Science (3) (Former AH 1)
Types and breeds of farm animals and poultry in the United States; world distribution, adaptation, production methods; foods and products produced by farm animals, their use by humans. (2 lecture, 3 lab hours)

70. Comparative Nutrition (3) (Former AH 71)
Prerequisite: Chem 2A-B, Bot 10 or Zool 10. Principles of nutrition; nutrients and their metabolism; comparison of qualitative nutrient requirements of monogastric and ruminant animals and man; role of animal food products in human nutrition.

80. Undergraduate Research (1–4; max total 4)
Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in animal science.

105. Animal Science Laboratory (2) (Former A Sci 20)
Prerequisite: A Sci 10 or permission of instructor. Development of skills in applying animal science principles and practices; discussion, demonstration, participation. (2 2-hour lecture-labs; field trips)

110. Anatomy and Physiology of Farm Animals (3) (Former AH 115)
Prerequisite: Zool 1, Chem 8. General structures of farm animals and physiological functions of organs of the animal body. (2 lecture, 3 lab hours)

120. Livestock Sanitation and Diseases (3) (Former AH 116)
Prerequisite: A Sci 110 or permission of instructor. Sanitation practices and use of disinfectants; cause, symptoms, prevention, and treatment of common diseases of livestock. (2 lecture, 3 lab hours)

125. Principles of Animal Breeding (3)
Prerequisite: A Sci 10 or permission of instructor. Principles of genetics as applied to domestic animals. Practices and problems commonly encountered in animal breeding.

130. Feed Mill Management (2) (Former AH 73)
Prerequisite: A Sci 70. Operation and maintenance of feed mills; compiling rations; mixing, buying, and selling feeds; participation in management and operations of college feed mill. (1 lecture, 3 lab hours)

140. Behavior of Domestic Animals (3)
Not open to students with credit in this section of 160T. Prerequisite: A Sci 10 or permission of instructor. Man's understanding and utilization of the principles of behavior in confined and free-ranging domestic animals. (2 lecture, 3 lab hours)

150. Animal Husbandry Seminar (1; max total 2) (Former AH 170)
Open to seniors majoring in animal husbandry. Latest developments in research; assigned research papers in animal husbandry to be presented in both oral and written form.

155. Animal Reproduction (3) (Former AH, DS 106, A Sci 100)
Prerequisite: A Sci 10 or 12; A Sci 125 or Biol 120. Principles of reproductive physiology and their application to domestic animals.

160T. Topics in Animal Science (1–4; max total 6 per discipline if no topic repeated)
Prerequisite: junior standing, permission of instructor. Anatomy, physiology, pathology, nutrition, genetics, economics.

170. Applied Animal Nutrition (3) (Former AH 172)
Prerequisite: A Sci 70 or permission of instructor. Quantitative nutrient requirements and allowances for domestic animals; feedstuffs and methods of processing; feeding systems and ration formulation for profitable livestock production.

180. Undergraduate Research (1–4; max total 4)
Open to juniors and seniors. Exploratory work on a suitable agricultural problem in animal science.

199. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

ANIMAL HUSBANDRY (A Sci)

11. Livestock Selection and Evaluation (3) (Former AH 2)
Basic factors involved in selection and evaluation of beef cattle, horses, sheep, and swine; relationships of live market animal traits to carcass desirability. (2 lecture, 3 lab hours)

21. Beef Husbandry (3) (Former AH 22)
Prerequisite: A Sci 10. Management of purebred and commercial beef herds; selection of breeding stock; management practices in fattening cattle; marketing slaughter and purebred cattle. (2 lecture, 3 lab hours)

31. Swine Husbandry (3) (Former AH 30)
Prerequisite: A Sci 10. Principles and practices of purebred and commercial swine husbandry; breeding, feeding, and management program. (2 lecture, 3 lab hours)

41. Sheep Husbandry (3) (Former AH 40)
Prerequisite: A Sci 10. Breeding, feeding management, and marketing of commercial and purebred sheep; breeds, setting up a program of breeding, housing, and equipment requirements; feeding and care of ewes and lambs; docking, castrating, shearing, tying, sacking, storing wool. (2 lecture, 3 lab hours)

51. Horse Husbandry (3) (Former AH 50)
Prerequisite: A Sci 10, 11. Breeds, selection, care, and feeding of light horses; their use and place in California agriculture. (2 lecture, 3 lab hours)

101. Livestock Evaluation (2; max total 4) (Former AH 3, 103)
Prerequisite: A Sci 10, 11, or permission of instructor. Detailed analysis of various visual and physical methods of appraising animal body types as related to functional and economic value of livestock. Written and oral summaries of evaluations. (1 lecture, 3 lab hours; field trips)

111. Advanced Beef Husbandry (3) (Former AH 122)
Prerequisite: A Sci 21. Research material in breeding, nutrition, diseases and management; records of performance, pedigrees, purebred sales, show herd management. (2 lecture, 3 lab hours; 1 week-end field trip)

121. Meats (3) (Former AH 10)
Prerequisite: A Sci 10. Evaluation of live animals and carcasses; selection and preparation of meats and meat products; survey of the meat industry in the United States. (2 lectures, 3 lab hours)

131. Meats and the Consumer (3)
Study of meats; quality and price selection, identification, nutritive value, preparation, storage, and government standards. (2 lecture, 2 lab hours)

141. Meat Evaluation (3)
Prerequisite: A Sci 10 or permission of instructor. Evaluation of live animals and carcasses with emphasis on current grading and evaluation concepts as applied to carcasses, meat products, and live animals. (2 lecture, 3 lab hours)

151. Advanced Horse Husbandry (3) (former AH 150)
Prerequisite: A Sci 10, 51. Advanced principles of horse husbandry; management of horse breeding farms, breeding systems, training and selling horses, western equitation. (1 lecture, 6 lab hours; 1 week-end field trip)

161. Animal Science Technology (3)
Prerequisite: junior standing or permission of instructor. Techniques used in applying theories and principles of the disciplines encountered in the animal sciences.

171. Marketing Livestock and Meat (3) (Former AH 175)
Prerequisite: junior standing and permission of instructor. Economic principles in marketing livestock and livestock products; demand, supply, distribution; markets and marketing procedures; classifying, grading, evaluating livestock for marketing. (2 lecture, 3 lab hours)

DAIRY HUSBANDRY (A Sci)

12. Dairying (3) (Former DS 11A-B)
Survey of all important branches of the dairy industry; principles and practices in milk production; basic principles of processing market products. (2 lecture, 3 lab hours)

112. Dairy Cattle Management (3) (Former DS 102)
Prerequisite: A Sci 12, Econ 1A. Basic ideas, costs, and concepts necessary for the successful operation of a modern dairy production unit.

122. Dairy Cattle Evaluation (2; max total 4) (Former DS 55, 105)
Prerequisite: A Sci 12. Functional anatomy in dairy cattle; detailed analysis of selection, classification, and scoring systems and their application to breeding programs. (1 lecture, 3 lab hours; field trips)

152. Artificial Insemination (3) (Former DS 110)
Prerequisite: A Sci 10 or 12, 110. Basic principles of artificial insemination in all species of domesticated animals including beef, dairy cattle, horses, sheep and swine; semen collection, processing, evaluation and use. (2 lecture, 3 lab hours)

POULTRY HUSBANDRY (A Sci)

14. Poultry Production (3) (Former PH 1)
Poultry production; brooding, rearing, laying flocks, feeding, and housing. (2 lecture, 3 lab hours)

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PLANT SCIENCE DEPARTMENT

Professors: Karle (Chairman), Biehler, Burger, Hewitt, Petrucci, Strong, Van Elswyk

Associate Professors: Brownell, R.D. Harrison, Ishimoto, A. Olney, Ritenour, Whaley

Assistant Professors: Badr, Koch

Part-time: Bien, Dierking, Dokoozlian, Domoto, Gates, D. Johnson, Canata, Leach, Porter, Reyburn, Sieckert, Yamamoto

The Department of Plant Science offers programs of study in the plant sciences, including all aspects of agriculture and applied biology related to the fields of agronomy, horticulture, ornamental horticulture, and viticulture. These include management and production factors as related to environment (soil, water and atmospheric effects, air pollution), cultural modifications and adaptations, protection against pests and diseases, storage and handling practices, utilization, marketing, and mechanization. Careers in modern scientific agriculture include positions in management, sales and service, research, teaching, and government agencies.

The courses offered in the disciplinary areas listed below provide the necessary background to prepare students for career objectives.

Plant Science (Plant) provides study in subject areas designed to complement the production disciplines in preparing students for work opportunities in soils, irrigation, propagation, breeding, and related areas.

Plant Protection (Plant) provides a broad selection of courses for training in physical and biological sciences, plant diseases, insects, weeds, agricultural inspection of food crops, and laws regulating food production. They are designed to prepare students for careers in agricultural chemical industries and private or governmental agencies dealing in crop care and crop protection. In addition, these courses provide a foundation for advanced study in preparation for careers as college teachers, extension specialists, and research scientists in experiment stations and industry.

Agronomy (Plant), including field crops and soil science, prepares students for specific crop production and general farming involving combinations of crops and livestock. They may also prepare students to qualify for employment opportunities in service and sales in seeds, pesticides, and fertilizers; agronomic research; gin management; farm management; and field work or research for county, state, and federal government agencies.

Horticulture (Plant) prepares students for general fruit farming, as managers of orchards, as inspectors in fruit processing plants, for supervisory positions in fruit packing plants, and for careers with county, state, and federal agencies.

Ornamental Horticulture (Plant) prepares students for the nursery industry, landscaping and grounds work, floral industry, and a variety of sales positions. The subject matter serves to enhance participation in farm and home landscape gardening and floral design as an avocation.

Vegetable Crops (Plant) prepares students for specialized farming in vegetable crops, processing and marketing, and regulatory inspection. The growth of the industry in the San Joaquin Valley offers a wide variety of employment opportunities. A vegetable garden is maintained with both fall and spring crops grown for student observation. Land is also available for vegetable projects.

Viticulture (Plant) is one of two instructional programs of its kind in the United States that prepare students for employment as viticulturists in such capacities as vineyard farmers, managers, and developers and positions in related fields of research, inspection, teaching, and packinghouse management for both fresh and dried grapes.

In addition, a selected variety of plant science courses will provide the necessary background for the following career objectives:

Natural Resources. Provides education in physical and biological sciences as they apply to the management of the renewable natural resources (soils, water, forests) designed for the student interested in an understanding of those parts of the environment managed by man or preparation for employment in soil conservation service, land use planning, waste disposal management, or graduate study.

Postharvest Physiology. Provides an education to prepare students for research work in the area of handling fresh fruits and vegetables for domestic as well as foreign markets.

Soil and Water Science. Provides an education in physical and biological sciences applied to soil-water-plant relationships designed for the student interested in farm management, irrigation system design, employment as fertilizer or sprinkler equipment salesman; preparation for governmental and industrial research, irrigation district management and planning, and graduate study.

Programs of Study: The Department of Plant Science provides competent advisers for students pursuing career objectives in, *but not limited to,* the following areas:

Career Objective	*Suggested Major*
Research agronomy	Agricultural science
Farming: field crops, vegetable crops	Agricultural science
Fruit production, citrus farming	Agricultural science
Vineyard management	Agricultural business
Ornamental horticulture: landscape design, nursery management, turf management	Agricultural Science or agricultural business
Viticulture	Agricultural science
Pomology: production, research	Agricultural Science
Diversified farming	Agricultural education
Vegetable processing: frozen, fresh	Agricultural science or agricultural business
Irrigation	Agricultural science
Soil science	Agricultural science
Agricultural sales: plant nutrients, weedicides, insecticides, fertilizers	Agricultural business
Plant pathology	Agricultural science
Agricultural entomology	Agricultural science
Range or pasture management	Agricultural science
Research and development: plant by-products, mechanization, plant breeding	Agricultural science

Plant Science Laboratory Units: Theoretical instruction in plant sciences is enhanced through practical application at the various laboratory units.

Orchard Laboratory: A 65-acre orchard is maintained as an instructional tool where students may practice all skills from land preparation through planting trees, harvesting, and marketing. A species block is maintained as well as larger plantings of citrus, peaches, plums, nectarines, almonds, and apricots.

Vineyard Laboratory: Viticulture facilities include a 160-acre vineyard field practice and research laboratory, raisin processing, dehydration and controlled raisin storage laboratory.

Post-Harvest Laboratory: Cold storage, freezing, and assembly-line facilities are available for packing fresh fruit for marketing.

Seed Processing Laboratory: The facility gives the students added understanding of the methods and problems involved in cleaning and processing seed for planting.

Ornamental Horticulture Laboratory: A large head house, lath house, and several environmentally controlled glass houses provide facilities for practice in nursery management and development of scientific gardening practices.

Pasture and Field Crop Laboratory: The major portion of the 1,190-acre college farm serves as a working laboratory and provides practice facilities in soils and irrigation and the growing and harvesting of cotton, grains, and grasses.

SUPERVISED PROJECTS

The agricultural sciences program is unique in that it provides opportunity for students to gain both theoretical training and practical experience in farming while pursuing their college programs. The supervised project experience is designed to supplement the lecture and laboratory assignments, giving students greater opportunity to develop the practical side of farming. The college owns all of the necessary equipment for student projects. A rental fee is charged for use of equipment. Proficiency in operating equipment must be demonstrated before projects may be undertaken. Students sign contracts wherein they agree to perform the labor required in caring for their projects. The Agricultural Foundation

serves as a banking agency in providing the money students may need for the project materials. Students must submit records on each enterprise to the Agricultural Foundation and share the profit or loss with the Foundation according to established percentages.

In the Department of Plant Science students have an opportunity for project participation, usually limited to five-acre plots. Under certain conditions, reduced or expanded acreage may be allowed. Students prepare seed beds, plant, cultivate, irrigate, control insect pests and weeds, and harvest and market their crops, in addition to making all managerial decisions necessary to completion of the enterprise.

COURSES

Note: Active immunization against tetanus (available through the Student Health Service) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the College Farm.

PLANT SCIENCE

PLANT SCIENCE (Plant)

10. Plant and Man (3)
Principles of plant structure, physiology, heredity, and environment in relation to growth, adaptation and management of crops.Techniques of research; future developments in plant sciences.

20. Plant Propagation (3) (Former OH 3)
Principles of sexual and asexual propagation; seed identification, seedage, cuttage, specialized plant structures for propagation; propagation media, rooting aids, structures. (2 lecture, 3 lab hours)

30. Soils (3) (Former Ag 136)
Prerequisite: high school chemistry or Chem 2A (Chem 2B or 2C concurrent). Physical and chemical properties of soils as a medium for plant growth; factors that influence soil formation; evaluation of current studies including food production, soil map interpretation, fertilizer use, soil's role in the biosphere. (1 Saturday field trip)

30L. Soils Laboratory (1)
Prerequisite: Plant 30 or equivalent (or concurrently). Physical, chemical, and biological analysis. Interpretation of field and laboratory data. (3 lab hours)

40. Water and Man (3)
Problem approach to man's need for and use of water; his management of water supply, allocation, use, disposal, and quality control for domestic, aesthetic, agricultural, industrial, power, navigation, and recreational uses.

50. Irrigation (3) (Former Ag 146)
Methods of irrigation adapted to the San Joaquin Valley; water requirements of various crops and methods of application. (2 lecture, 3 lab hours; 1 Saturday field trip)

80. Undergraduate Research (1–4; max total 4)
Open to freshmen and sophomores with permission of instructor. Exploratory work on a suitable agricultural problem in plant science.

110. Advanced Irrigation (3) (Former Ag 184)
Prerequisite: Plant 50 or equivalent. Evaluation of the equipment design, operation, soil and crop response of methods of irrigation, sprinkler methods; pipe line and other methods featuring water control, soil and water conservation. (2 lecture, 3 lab hours; 1 week end field trip)

120. Soil Classification and Survey (2)
Prerequisite: Plant 30. Influence of environmental factors on soil development; description and identification of soil profiles and mapping, interpretation of survey data. (Saturday field trips)

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140. Plant Breeding (3) (Former CP 150)
Prerequisite: Biol 120. Application of genetic and environmental principles to improvement of plants; heredity and variation in plants, effects of environmental factors on plant improvements, effects of self and cross fertilization, principles and results of selection and hybridization in plant improvement. (2 lecture, 3 lab hours)

150. Soil Management (3) (Former Ag 182)
Prerequisite: Plant 30. Factors affecting soil fertility, management of soils, attaining continuous maximum productivity. Physical, chemical, and field tests on soil fertility and crop management. (2 lecture, 3 lab hours; 1 Saturday field trip)

152. Soil Fertility (3)
Prerequisite: Chem 2A-B and 3 units of soils. Evaluation of plant nutrient status of soils, chemistry of the nutrient elements, soil and plant tissue analyses and interpretation, fertilizer use.

160. Plant Science Seminar (1; max total 2)
Undergraduate seminar for advanced students in junior or senior year.

170T. Topics in Plant Science (1–4; max total 6 per discipline if no topic repeated. Same as Geog 114 section)
Prerequisite: junior standing. Plant science, agronomy, horticulture, and other associated areas.

180. Undergraduate Research (1–4; max total 4)
Open to juniors and seniors. Exploratory work on a suitable agricultural problem in plant science.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

PLANT PROTECTION (Plant)

21. Plant and Food Protection (3) (Former Ag 13)
Origin, history, and evaluation of protective measures (chemical, biological, cultural) for the control of diseases, weeds, insects, and rodents in the field and around the home.

91. Apiculture (2) (Former Ag 113)
Fundamentals of beekeeping; manipulation of the hive; diseases and enemies of bees; nectar sources and pollination problems; production and marketing of honey and beeswax; laws and regulations pertaining to beekeeping. (1 lecture, 3 lab hours)

101. Plant Quarantine (3) (Former Ag 105)
Prerequisite: Plant 121. The biological, economic, and administrative aspects of plant quarantine; study of the plant pests under federal and state quarantine laws.

111. Fruit and Vegetable Standards (3) (Former Ag 114)
State and federal standards and regulations for packing, processing, and shipping fruits and vegetables. (2 lecture, 3 lab hours)

121. Economic Entomology (3) (Same as Ent 106. Former Ag 106)
Prerequisite: Bot 10 or Zool 10. General and economic entomology; taxonomy of the principal orders of insects; life histories, habits, recognition, and control of the principal agriculture insect pests of the San Joaquin Valley. (2 lecture, 3 lab hours; field trips)

131. Weeds (3) (Former CP 60)
Prerequisite: Bot 1, Chem 2A-B. Weeds common to the San Joaquin Valley, their identification and control. (2 lecture, 3 lab hours)

141. Fruit Diseases and Pests (3) (Former V110)
Fruit diseases and pests; identification and control; application of sprays, insecticides; establishment of control programs. (2 lecture, 3 lab hours)

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151. Properties of Pesticides (3) (Former Ag 159)
Prerequisite: Chem 8. Physical and chemical properties of the principal insecticides, fungacides, and nemotocides; formulations, regulations, and typical uses.

161. Plant Nematology (3)
Prerequisite: Zool 10 or equivalent. Morphology, life history, parasitic activity, and control of economically important nematodes with emphasis of plant-parasitic forms. (2 lecture, 3 lab hours)

171. Plant Pathology (4) (Former Ag 130)
Prerequisite: Bot 1. Nature, cause, and control of plant disease in economic agriculture plants. (2 lecture, 6 lab hours)

181. Soil Microbiology (3)
Isolation, population studies and biochemical activities of soil organisms related to organic matter and agricultural chemicals decomposition, including their effects on plant growth. (2 lecture, 3 lab hours)

AGRONOMY (Plant)

13. Agronomy (3) (Former CP 11)
Principles of crop production, survey of important field crops, production methods and major uses in California and the San Joaquin Valley. (2 lecture, 3 lab hours; 2 Saturday field trips)

23. Forage Crops (3) (Former CP 51)
Prerequisite: Plant 13 or permission of instructor. Irrigated forage crops of California as related to livestock enterprises; cultural methods, harvesting, marketing, quality, insect and disease control. (2 lecture, 3 lab hours)

33. Row Crops Production (3) (Former CP 52)
Cultural methods, insect and disease control; harvesting; quality and marketing of major California row crops including cotton, other fiber and oil crops, sugar beets, beans. (2 lecture, 3 lab hours)

43. Cereal Crops (3) (Former CP 53)
Prerequisite: Plant 13. Cereal crops common to the San Joaquin Valley; varieties and cultural practices, harvesting and marketing. (2 lecture, 3 lab hours)

113. Seed Production (3) (Former CP 103)
Prerequisite: Plant 13 or permission of instructor. Principles and practices in the culture of vegetable and field crops for seed production; harvesting, storage, yields, quality, seed laws, certification, seed cleaning, and marketing. (2 lecture, 3 lab hours)

123. Field Crop Technology (3) (Former CP 105)
Prerequisite: Chem 2A, 6 units of agronomy or permission of instructor. Evaluation of factors that impart quality to fiber and oil crops, cotton, cereals, and other major California field crops. Relationship of crop quality to varieties, cultural practices, insects and disease, harvesting and storage. (2 lecture, 3 lab hours)

173. Range Management (3) (Former CP 118)
Prerequisite: Plant 13 or permission of instructor. Identification of range forage; estimating carrying capacity; methods of range conservation, controlled grazing, water development, rodent control, fertilization, reseeding, brush removal; identification of poisonous plants. (2 lecture, 3 lab hours; 1 Saturday field trip)

183. Advanced Agronomy (3) (Former CP 152)
Prerequisite: Bot 104, 6 units of agronomy or permission of instructor. Relating the various production techniques to the physiology of agronomic crops. Practical problem solving; field experimentation; research paper evaluation. (2 lecture, 3 lab hours)

VEGETABLE CROPS (Plant)

14. Vegetable Crops (3) (Former CP 12)
Culture of vegetable crops for market and home; importance, varieties, cultivation, harvesting, storing, and marketing; vegetable diseases and insect pests; vegetables grown commercially in the San Joaquin Valley. (2 lecture, 3 lab hours; 2 Saturday field trips)

114. Vegetable Field Crops (3) (Former CP 56, PlSc 34)
Prerequisite: Plant 14. Mechanized production, harvesting, processing, packaging, and marketing of vegetables common to the western San Joaquin Valley; morphology and development; management peculiar to vegetable crops. (2 lecture, 3 lab hours; 3-day field trip)

174. Physiology of Vegetable Crops (3)
Prerequisite: Plant 14, Bot 104. Principles of plant physiology related to factors associated with maturity, quality, pest resistance, development of new varieties, and production of vegetables. (2 lecture, 3 lab hours)

ORNAMENTAL HORTICULTURE (Plant)

15. Principles of Landscape Gardening (3) (Former OH 22)
Planting and maintenance of the garden; selection, planting, fertilization, irrigation, pruning, disease and insect control, weed control; lawn planting and care; the home vegetable and fruit garden, house and patio plants. (2 lecture, 3 lab hours)

25. Plant Identification (3) (Former OH 33)
Identification, habits of growth, culture and landscape use of trees, shrubs, vines, annuals, herbaceous perennials including tropicals, subtropicals, conservatory and house plants. (2 lecture, 3 lab hours)

35. Principles of Nursery Operation (3) (Former OH 53)
Prerequisite: Plant 20. Nursery structures; practice in production of ornamental, fruit, nut, annual, perennial, bedding, vegetable, and pot plants; retail and wholesale nursery practices. (2 lecture, 3 lab hours)

55. Introductory Landscape Design (3)
History and development in the field of landscape design. A study of the need for landscaping in modern man's environment. Consideration of landscaping practices for the modern home and their effect on the home microenvironment.

65. Floral Design (3)
Introductory floral design; principles and rules of design and color using plants as the media; influence of the Japanese and European schools; emphasis on modern American line-mass design. (2 lecture, 3 lab hours)

105. Arboretums and Botanical Gardens (2)
Arboretums and botanical gardens in the United States; purpose, design, and functions of arboretums and botanical gardens in the present environment. (1 lecture, 3 lab hours)

115. Production of Ornamental Plants (3) (Former OH 123)
Prerequisite: Plant 35, Bot 1. Production of ornamental trees, shrubs, vines and ground-covers by budding, grafting, bare rooting, and layerage; growth habits, landscape use, identification, cultural requirements. (2 lecture, 3 lab hours)

125. Ornamental Trees (3) (Former OH 125)
Prerequisite: Bot 1, Plant 20. Trees grown in California for landscaping, shade and ornamentation; identification, habits of growth, cultural requirements, landscape, use. (2 lecture, 3 lab hours)

145. Floriculture (3)
The construction, operation, and management of greenhouses and other forcing structures. The greenhouse environment and its relationship to the production of commercial florist crop. (2 lecture, 3 lab hours)

155. Plant Hormones (3)
The effects of plant hormones and other growth regulating chemicals on the physiology, growth, and development of horticultural plants. (2 lecture, 3 lab hours)

165. Turfgrass Production and Management (3) (Former OH 132)
Production and maintenance of grass for lawns, public parks, public institutions, playgrounds, playing fields, golf courses, bowling greens; identification of turfgrasses and turfgrass seed. (2 lecture, 3 lab hours)

175. Nursery Management (3) (Former OH 162)
Prerequisite: Plant 15, 25, 115. Design, construction and utilization of nursery structures; control of temperatures and lighting; business organization. (2 lecture, 3 lab hours)

185. Landscape Design (3) (Former OH 163)
Prerequisite: senior standing. The analysis and solution of construction problems as they relate to design and site development. (2 lecture, 3 lab hours)

195. Advanced Floriculture (3)
Prerequisite: Plant 145. Practices and techniques in the production of major floricultural crops with emphasis on cut flowers, potted plants, and bedding plants. (2 lecture, 3 lab hours)

HORTICULTURE (Plant)

16. Fruits of the World (3) (Former H 11)
Origin, history, nutrition value and world distribution of fruits; factors affecting growth, storage and handling, fruit processing, and marketing.

16L. Principles of Fruit and Nut Growing Laboratory (1)
Prerequisite: Plant 16 (concurrent). Application and demonstration of the principles of fruit growing. (3 lab hours)

116. Principles of Fruit Production (3) (Former H 12)
Adaptation of fruits to their environments; fundamentals of fall cultural practices; species and varietal differences for peach and nectarine, plum, apple, pear, and apricot. (2 lecture, 3 lab hours)

126. Principles of Fruit Production (3)
Prerequisite: Plant 16 or equivalent. Floral and vegetative development, pollination, and nutrition; fundamentals of spring cultural practices; species and varietal differences for almond, sweet cherry, prune, and walnut. (2 lecture, 3 lab hours)

136. Principles of Citriculture I (3)
Prerequisite: Bot 1 or equivalent. A study of the history and botany of citrus and citrus relatives; citrus varieties, flowering, and fruiting. (2 lecture, 3 lab hours)

146. Principles of Citriculture II (3)
Prerequisite: Bot 1, Plant 136. Commercial variety adaptation to environment (soil and climate), cultural practices, rootstocks, propagation, production and economics. (2 lecture, 3 lab hours)

166. Postharvest Physiology of Horticultural Crops (4)
Prerequisite: Bot 104. Physiology of maturation and senescence of tree fruit, grapes, and vegetables; fundamentals of handling (harvesting, storage, disease control, packaging). (3 lecture, 3 lab hours)

186. Orchard Management (3) (Former H 186)
Prerequisite: Plant 116, 126. Practices and principles in planning, establishing, and maintaining fruit and nut crops. (2 lecture, 3 lab hours)

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VITICULTURE (Plant)

17. General Viticulture (3) (Former V 11)
Production of grapes; history, structure, and climatic requirements of the vine; grape judging; study of wine, raisin and table grapes; practice in fall and winter cultural operations with emphasis on pruning. (2 lecture, 3 lab hours; 3 on-campus field trips)

27. Raisin Production and Processing (3) (Former V 13)
Prerequisite: Plant 17 or permission of instructor. Principles and practices of raisin production, dehydration and processing operations; utilization of the college vineyard and raisin processing laboratory. (2 lecture, 3 lab hours)

117. Vineyard Operations (4) (Former V 16)
Application of spring vineyard operations with emphasis on planting and propagation; effects of growth regulators, vine behavior, physiology, and vine training. (3 lecture, 3 lab hours)

127. Grape Varieties (3) (Former V 50)
Prerequisite: Plant 17. Grape varieties common to California; rootstocks and species, identification, adaptability, use and acreage; taste testing fresh grapes.

177. Marketing of Grapes and Tree Fruit (4) (Former V 101)
Prerequisite: Plant 116 or 117, Ag Ec 31. Fundamentals of grape and fruit handling (harvesting, grading, packing, cooling, storage, and transportation; marketing principles, orders, and centers; and principles concerned with fruit maturity. (3 lecture, 3 lab hours; 3-day field trip)

187. Advanced Viticulture (3) (Former V 166)
Prerequisite: permission of instructor. Relating the various cultural techniques to the physiology of the grape vines; effect of these techniques on vine health and vigor; economics and management of vineyards. (2 lecture, 3 lab hours; 3-day field trip)

SCHOOL OF BUSINESS

GENERAL 117

ACCOUNTING AND QUANTITATIVE STUDIES DEPARTMENT 121

FINANCE AND INDUSTRY DEPARTMENT 125

MANAGEMENT AND MARKETING DEPARTMENT 129

OFFICE ADMINISTRATION DEPARTMENT 134

SCHOOL OF BUSINESS

Robert E. Hampton, Acting Dean

Acting Assistant Dean ..... Allen M. Agnew
Director, Bureau of Business Research and Service ..... Marshall E. Minich

Department	*Chairman*
Accounting and Quantitative Studies	Clayton R. Tidyman
Finance and Industry	Robert A. Carr
Management and Marketing	John H. Kruger, Jr.
Office Administration	Berle Haggblade

The School of Business prepares students for professional careers in the business world and for teaching in secondary schools and junior colleges. At the undergraduate level it offers a program in Business Administration leading to the Bachelor of Science Degree. The program is designed to provide a knowledge of the principles, procedures and practice of business management; an understanding of the role and responsibility of business in present day society; a foundation of basic background materials for participation in the American enterprise system; and the proficiency in technical skills and information required by our complex business society.

At the graduate level the master of business administration and master of science degrees are offered. The master of business administration degree is designed to prepare students for careers in management of business enterprises and other organizations, including public corporations, educational systems, and nonprofit institutions. The master of science degree provides specialized advanced work in business as distinguished from the broader program of management. Either degree may be used to deepen the competence of teachers of business subjects in secondary schools and junior colleges.

The school offers appropriate programs for students planning to work toward a teaching credential with a major in business. With the proper selection of courses, business administration is recognized as an academic major for credential purposes. Business teacher education students should consult the appropriate advisers in the Schools of Business and Education as early in their programs as possible. Students wishing to combine the credential with a master's degree should also consult the Assistant Dean of the School of Business and the Dean of the School of Graduate Studies.

The School of Business is a member of and is accredited by the American Association of Collegiate Schools of Business.

BUREAU OF BUSINESS RESEARCH AND SERVICE

The Bureau of Business Research and Service is organized within the School of Business to meet the research and service needs of the students and faculty of the School of Business and of the San Joaquin Valley business community. It is a member of and accredited by the Association for University Business and Economic Research. The Bureau compiles, interprets, and publishes statistics and studies on the local and regional economy, including *Fresno Facts and Trends,* which is published monthly in cooperation with the Fresno County and City Chamber of Commerce. It facilitates research in appropriate areas by the students and faculty; seeks cooperative arrangements with outside organizations for conducting specific research and service projects; and arranges and conducts executive development and other programs as part of the School's responsibility to provide continuing education in business.

BUSINESS ADVISORY COUNCIL

A group of 20 leading business executives of the San Joaquin Valley serves as an advisory body to the School of Business, helping to keep the program attuned to the changing needs of business. The Council meets periodically with the faculty and its members participate in a number of school functions. They are also available to faculty and students for consultation and as speakers. The Council sponsors the Executive-in-Residence Program, an Annual Awards Dinner for graduating students, and other events which benefit the School of Business.

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MANAGEMENT SEMINARS

Several times during each semester, a local business firm brings its top management to the school for a series of seminar type meetings with students. The contact between students and executives allows students to develop a fuller perspective of the managerial function. Arrangements are managed by the Inter Business Council, composed of representatives of professional business student organizations.

OTHER SPECIAL FEATURES

Opportunity is afforded students through classes and student organizations to become acquainted with business and industrial organizations in California and the San Joaquin Valley. Effort is made to adapt the program to meet the particular needs of the San Joaquin Valley. Business and industrial concerns in Fresno and vicinity cooperate to make possible practical application of the theory studied in the classroom through field trips and guest lecturers in classes. A special course, business lectures, brings to the campus each week a business executive who discusses some topic of current business and economic interest. The Beta Gamma Sigma Colloquium brings to the campus well-known top management men for discussions with selected senior and graduate students. The school sponsors professional organizations for both men and women. A convocation of all business students is held once each semester, bringing to the campus a well-known leader to discuss some scholarly aspect of business. This blending of the practical and theoretical is designed to insure vitality of instruction and breadth of vision.

In the belief that education for business leadership requires rigorous application of a variety of managerial techniques and principles, a special program for seniors has been instituted in which, for one semester, teams of students and instructors engage in an in-depth analysis of business problems and their solutions. Problem solving and field work are important elements of the semester, together with team instruction.

HIGH SCHOOL PREPARATION

In addition to the usual college preparatory courses it is recommended that students include four years of English, mathematics at least through intermediate algebra, and one year each of typewriting and bookkeeping in their high school programs.

COMMUNITY COLLEGE PREPARATION

It is recommended that students taking their first two years of study at a community college complete, if possible, general education requirements, including the appropriate required courses in behavioral sciences, communications, mathematics, and a year of principles of economics. The following business courses, which are required in the options, are also recommended: principles of accounting, one semester of automation and data processing, one semester each of business law and business statistics. Certain other courses offered in the two-year colleges, but taught at the upper division level at Fresno State, may be accepted for equivalent course credit without reducing the number of upper division units required for the baccalaureate degree. With this exception, other transfer business courses taken in community colleges are accepted as elective credit. Transfer students must see the School of Business evaluator prior to registering for business classes.

BACHELOR OF SCIENCE DEGREE IN BUSINESS ADMINISTRATION

All students seeking a bachelor of science degree in business administration must complete 124 units. A uniform set of 36 units constitutes the business core and is required in all options. Students with a major in business administration must complete a minimum of 39 upper division business units. They must also complete 9 units outside the school in addition to the 40-unit general education course requirement for a degree. Within these 49 units the following specific requirements of the school must be met: 3 units each of Econ 1A and 1B, English composition and speech. Options in the Accounting and Quantitative Studies and Finance and Industry Departments require Math 71 and 72 or Q M 21A-B. Options in the Management and Marketing and the Office Administration Departments require Math 51 or Q M 21A. All students must also complete 9 units from the areas of cultural anthropology, and/or psychology and/or sociology. In addition, either Chem 2A and Phys 2A or Chem 2A-B and 8 are required for the agribusiness option. The remaining 39 unit requirement is satisfied by completing courses in one of the various options of the business administration major. See departmental listings of options.

School of Business Core Requirements *Units*

The 36 unit business core provides students with a general background commonly acknowledged as furnishing the basis for effective management of business enterprise. The courses providing this background are grouped as follows:

A. A background of the concepts, processes, and institutions in marketing and distribution, production and financing functions of business enterprises: Mgt 124, Fin 133, Mktg 100, (see also Mgt 101)	9
B. A background of the economic and legal environment of business enterprise along with consideration of the social and political influences on business: B A 18	3
C. A basic understanding of the concepts and methods of accounting, quantitative methods, and information systems: Acct 4A-B, Q M 65, 103	12
D. A study of organizational theory, interpersonal relations, control and motivation systems, and communications: Mgt 110A-B or 110, (see also Mgt 101)	6
E. A study of administrative processes under conditions of uncertainty including integrating analysis and policy determination at the overall management level: Courses satisfying this requirement in each option are specified by each department (see also Mgt 102)	6
	36

BUSINESS MINORS

Administration of the Performing Arts

Provides opportunity to study the economic and business problems of the arts, to explore their future implications, and to supply the necessary tools for administrative decision making.

	Units
Acct 3, B A 18, 128, Mgt 110A, Q M 65	15
Mktg 140	3
	18

General Business

Designed for students with majors in other fields who wish a minor in the broad basic areas of business. A minor appropriate for use on a credential program may be developed by students from nonbusiness areas in consultation with the school credential adviser.

	Units
Acct 4A	3
Elect from: B A 18, Fin 133, Mgt 110A-B, Mktg 100, Q M 65	6
Elect from not more than two fields (8 ud): Acct, B A, Fin, Ind R, Mgt, Mktg, O Ad, Q M	11
	20

Office Administration

Designed primarily to enable students, especially those in professional studies, the humanities, and other liberal arts fields, to acquire the basic business preparation necessary to enter their chosen fields.

	Units
O Ad 4, 23	7
O Ad 112, 114, 121	9
	16

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and see the sections on *Public School Credentials* and the *School of Education.*

MASTER OF BUSINESS ADMINISTRATION DEGREE

The degree of master of business administration is designed to prepare students for careers in management of business enterprises and other organizations, including public corporations, educational systems, and nonprofit institutions; and in college teaching. It is awarded upon satisfactory completion of a two-year program of study or its equivalent, normally 54 units. The first year is designed for students holding the bachelor's degree in some field other than business. Students with a bachelor's degree in business from an accredited institution may enter directly into the second-year program, but must take at least 30 units in graduate standing to complete the degree. Students whose undergraduate work includes courses normally required in the first-year graduate program may have their total program reduced. For details, consult the Assistant Dean, School of Business. For detailed information about the graduate program, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

MASTER OF SCIENCE DEGREE IN BUSINESS ADMINISTRATION

The master of science degree is available for students in specialized programs in business. For details, consult the Assistant Dean, School of Business. For detailed information about the graduate program, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENT

The following courses will satisfy general education requirements if not used on the major. *Area II:* B A 18, 118, Fin 137, Ind R 150, Mgt 110A-B, Mktg 100. *Area IV:* Q M 60, 65, O Ad 105. *Area V:* B A 8, 10, 50, Fin 143, 144, 180, Mktg 140, 150, Q M 162.
(See *General Education—Courses)*

ACCOUNTING AND QUANTITATIVE STUDIES DEPARTMENT

Professors: Tidyman (Chairman), Bedrosian, Costis, Emerson, Mortimer, W. Parker, Titus, Wayne

Associate Professors: E. Christensen, Elhag-Ali, Schroeder

Assistant Professors: Brum, L. Jensen, Johnston, Malkani, McFerrin, H. Miller, Posey, Simis, F. Taylor

Part-time: Chaffe, Chou, Safer

MAJOR IN BUSINESS ADMINISTRATION

School of Business Core Requirements (A through E) See *School of Business—BS Degree in Business Administration Accounting Option:* Departmental requirement for Area E: Acct 140, 162. (See also Mgt 102) *Quantitative Analysis Option:* Departmental requirement for Area E: Q M 164, 161B or 166. (See also Mgt 102)

Accounting Option	*Units*
Acct 120A-B, 132, 144A, 144B or 167	15
B A 118, Q M 60, 64	9
O Ad 105	3
	27
General Electives	12
	39

Quantitative Analysis Option	
B A 100, Q M 60, 63, 161A	12
Elect from: B A 115, 118 or 119	3
Elect from: Q M 174, 175, 176, or 178	3
	18
General electives	21
	39

COURSES

ACCOUNTING (Acct)

3. Essentials of Accounting (3)
Not open to students majoring in accounting or business administration. Basic concepts in preparation of business financial statements; introduction to understanding, analyzing, and interpreting accounting data by investors, managers, and creditors for decision making, planning, and control. Only minor attention given to recordkeeping procedures.

4A-B. Financial and Managerial Accounting Principles and Systems (3–3)
Not open to freshmen or students with credit in Acct 1A-B. (A) Financial accounting; accounting statements, transaction analysis, and data accumulation; balance sheet analysis and interpretation partnerships, corporation accounting; taxation problems; current external financial reporting problems. (B) Managerial control and information systems; organization, planning, budgeting; cost accumulation and capital budgeting; measuring and reporting performance.

120A-B. Intermediate Accounting (3–3)
Prerequisite: for 120A, Acct 1A-B or 4A-B; for 120B, Math 71 and 72 or Q M 21A-B recommended. Preparation and analysis of balance sheet and income statements; partnership and corporation accounts; basic accounting theory; theory of current and fixed assets, investments, liabilities, funds, reserves, and accounting ethics.

128. Managerial Accounting (3)
Not open to students with credit in Acct 120A or 132; not applicable for credit toward major in accounting. Prerequisite: Acct 1A-B or 4A-B. Uses of accounting data as an aid in business management; nature of accounting data, uses and limitations; relationships to quantitative methods and computer technology.

132. Cost Accounting (3)
Prerequisite: Acct 1A-B or 4A-B; Math 71 and 72 or Q M 21A-B recommended. Industrial cost accounting; general principles of job-order, process and standard cost systems; special problems; use of linear programming and computer.

140. Accounting Information Systems (3)
Prerequisite: Acct 132. Framework and tools for the design, implementation, and control of information systems. Systems, concepts, problem identification, user requirements, methods of systems analysis and data processing; measurement, coding, recording, transfer, storage, reporting and analysis of information.

144A-B. Tax Accounting and Planning (3–3) (Former Acct 144)
(A) Effect of federal and California income tax laws on individual tax returns and tax planning. (B) Prerequisite: Acct 120A-B. Effect of federal and California income tax laws on partnerships, corporation, estates and trusts; social security taxes, estate and gift taxes; business income tax planning.

162. Auditing (3)
Prerequisite: Acct 120A-B (120B may be taken concurrently). Objectives and techniques in verification of business financial statements; duties, responsibilities, and professional ethics of the auditor; auditor's reports; analysis of internal controls; audits of computerized systems.

167. Advanced Accounting Problems (3) (Former Acct 167A-B)
Prerequisite: Acct 120B. Partnership, corporation, governmental and institutional accounting.

189T. Topics in Accounting (1–3; max total 6 if no topic repeated)
Prerequisite: 12 units of accounting. Accounting theory; contemporary developments in financial, managerial, or public accounting.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

199. Supervised Work Experience (1; max total 4)
Open only to accounting majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 series. Graduate courses are listed under *Business.*

QUANTITATIVE METHODS (Q M)

21A-B. Quantitative Analysis (3–3) (Former Bus Ad 21, 21A-B)
(A) Prerequisite: two years high school algebra, one year high school geometry. Applications of finite mathematics and discrete probability models in the quantitative formulation and solution of problems of modern management. (B) Prerequisite: B A 21A or equivalent. Applications of selected tools of mathematical analysis and continuous probability models in the quantitative formulation and solution of problems of modern management.

60. Computer Concepts (3) (Former B A 60)
Introduction to computer hardware and software systems, and to several basic computer languages. Discussion of the social impact of computers and automation.

63. Automation and Computer Language—FORTRAN (3) (Former B A 62A)
Not open to students with credit in Engr 70, B A 62, 62A or 160. Prerequisite: Q M 60 or permission of instructor. Programming in FORTRAN, cards, disk, and tape.

64. Automation and Computer Language—COBOL (3) (Former B A 62B)
Not open to students with credit in B A 61 or 62B. Prerequisite: Q M 60. Programming in COBOL, cards, disk, and tape 1/0.

65. Statistical Analysis (3) (Former B A 65)
Not open to students with credit in B A 102. Prerequisite: Math 51 or 71 or Q M 21A or equivalent; Econ 1A-B recommended. Measures of central tendency; distributions; variations; time series analysis; seasonal variations; index numbers; joint, marginal and conditional probabilities; the Bayes Theorem; discrete probability distributions.

103. Advanced Statistical Analysis (3) (Former B A 103)
Prerequisite: Q M 65, Math 71, or Q M 21A recommended. Continuous probability distributions; theory of sampling; sampling distributions; point and interval estimations; significance tests; Bayesian statistics; the Chi-square and analysis of variance tests; regression and correlation models; use of computer statistical packages to solve business problems.

161A-B. Principles of Operations Research (3–3) (Former B A 161A-B)
Q M 161A not open to students with credit in B A 161. (A) Prerequisite: Q M 65. Systems approach to decision making; mathematical models and management; OR tools and techniques; modern decision theory. (B) Prerequisite: Q M 103, 161A. Stochastic models, single station finite and infinite populations, probability distributions, queueing theory, simulation, Monte Carlo method. (PERT/CPM).

162. Advanced Computer Programming (3) (Former B A 162)
Prerequisite: Q M 63, 64. Algorithmic and procedure-oriented languages; arrays, graphs, sorting, merging, symbol tables, searching, list processing, simulation techniques, discs and tape program segmentation and linkage.

164. Interactive Decision Making (3; max total 6) (Former B A 164)
Limited to seniors with business and quantitative background. Participation in interactive, dynamic business games. Applications of techniques of finance, accounting, personnel management, and quantitative areas to business problems. (3-day field trip required)

166. Applied Computer Systems (3) (Former B A 166)
Prerequisite: Acct 4A-B, 128 or 132, Q M 64 (Q M 63 and 161A-B desirable). Development and programming of management information systems; accounting subsystems for external reporting and for internal control; synthesis of operations research, accounting, and management control techniques.

168. Data Processing Management (3) (Former B A 168)
Prerequisite: Acct 4A-B, 128 or 132, Q M 63 or 64 (Mgt 124 desirable). Theories, cost and problems of operation of a computer center; standards; flow of work, scheduling, batching, spooling, multiprogramming, and multiprocessing techniques as methods of control and operation.

169. Machine Language Programming (3) (Former B A 169)
Prerequisite: Q M 63 or 64. Machine assembly and symbolic languages; report generators; development of macro instructions. Requires development of programs in several languages.

173. Computer Configurations (3) (Former B A 173)
Prerequisite: Q M 63, 64, 169, and a basic electronics course. In-depth study of selection and installation of hardware and software of various computers; feasibility studies, comparisons of self-managed versus service bureau operations; comparison of competitive systems; costs of reprogramming.

174. Regression and Correlation Models Time Series (3) (Former B A 174)
Prerequisite: Q M 63, 103. Bivariate, joint and conditional probability distributions, regression analysis, linear and nonlinear regression and multiple relationships, covariance and significance tests; autocorrelation, serial and partial correlation; time series analysis.

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175. Sample Survey Methods and Applications (3) (Former B A 175)
Prerequisite: Q M 63, 103. Sampling distributions, sample design, estimations of means, proportions, ratios, totals, simple random sample; stratified, cluster, and systematic sample design; replicated sampling techniques, acceptance sampling; industrial uses of sampling and nonprobability sampling.

176. Design of Scientific Experiments (3) (Former B A 176)
Prerequisite: Q M 63, 103. Notion of sampling distributions, theoretical probability distributions, gamma and F-distribution; analysis of variance, one-way and two-way classification tests; mixed and random effect models. Latin and Graeco Latin squares; factorial experimentation.

178. Bayesian Inference and Decision Theory (3) (Former B A 178)
Prerequisite: Q M 63, 103. Revision of probability and subjective interception, the Bayes' theorem, statistical estimation of various parameters and decision theory, prior analysis and prior probability distributions; posterior analysis and posterior probability distributions; utility problems, expected profit of perfect information.

189T. Topics in Quantitative Methods (1–3; max total 6 if no topic repeated)
Prerequisite: 12 units in quantitative methods. Theory or application of statistics, operations research, or computers applied to current developments.

190. Independent Study (1–3; max total see reference)
See *General Information—Independent Study.*

199. Supervised Work Experience (1; max total 4)
Open only to quantitative studies major students. Prerequisite: permission of instructor. Supervised work experience in business and industry.

200 series. Graduate courses are listed under *Business.*

FINANCE AND INDUSTRY DEPARTMENT

Professors: R. Carr (Chairman), Austin, Benson, W. Brooks, I. Davis, Dodds, O'Brien
Associate Professors: Blankenship, Doyel, P. Lange, Minich, Nwoko
Assistant Professors: Hull, Kutscher

MAJOR IN BUSINESS ADMINISTRATION

School of Business Core Requirements (A through E)

See *School of Business—BS Degree in Business Administration.*

Departmental requirement for Area E: Fin 104, 139. (See also Mgt 102)

Finance Option	*Units*
Acct 132	3
B A 100, Fin 135, Q M 60	9
Elect from: B A 115, 118 or 119	3
Elect from: Fin 132, 134, 137	6
Q M 161A, 164	3–6
	24–27
General electives	12–15
	39

Agribusiness Option	
Acct 132	3
B A 100, Fin 135, Q M 60	9
B A 115, 118 or 119	3
Approved electives from the School of Agricultural Sciences	9–12
	24–27
General electives	12–15
	39

Business Economics Option	
Acct 132	3
B A 100, Fin 135, Q M 60	9
B A 115, 118 or 119	3
Elect from: B A 101, 105, Econ 110, 103, Mktg 104	9–12
	24–27
General electives	12–15
	39

Insurance Option	
Acct 132	3
B A 100, Fin 135, 143, 144, Q M 60	15
Elect from: B A 115, 118 or 119	3
Fin 132, 134, 137	3–6
	24–27
General electives	12–15
	39

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Legal Environment of Business Option	*Units*
Acct 132	3
B A 100, Fin 135, Q M 60	9
B A 115, 118 or 119	3
Elect from: B A 115, 118, 119, 156, 184, Econ 174	9–12
	24–27
General electives	12–15
	39

Real Estate and Urban Land Economics Option	
Acct 132	3
B A 100, Fin 135, Q M 60	9
B A 115, 118 or 119	3
Elect from: B A 184, Fin 180, 181, 183, 186	11–12
	26–27
General electives	12–13
	39

COURSES

BUSINESS ADMINISTRATION (B A)

8. Law and Society (3)
For nonbusiness students. Nature and functions of the legal system; roles of legal institutions; examination of selected rule systems; legal reasoning; case studies; analysis.

10. Business as a Dynamic Social Force (3)
Open only to lower division students. Examination of the interaction of business and social forces in modern society. Nature of business and the management of firms in a changing environment; interrelationships among business, government, labor, and the public. Emphasis on current business-environmental problems.

18. Law and the Business Environment (3) (Former B A 118A)
Prerequisite: sophomore standing. Sources, forms, and expressions of law; general law of contracts, agency, and employment; case studies; analysis.

50. Business Lectures (1; max total 2)
Various viewpoints on current business problems and developments presented by a different guest business executive each class meeting.

100. Business Economics (3)
Prerequisite: Econ 1A-B. Applications of economic principles in business management; measure of profit, analysis of demand, cost analysis; price, wage, and public policies; case studies.

101. Ethics and the Economy (3)
Theories of ethics and their relevance to the realm of business; economic, social, and political implications of theories advanced by Adam Smith, Machiavelli, William Graham Sumner, John Dewey, Keynes, Eric Fromm, and others.

105. Economics of Consumption (3)
Prerequisite: Econ 1A-B. Theory of consumer equilibrium; theory of value and price under various market structures; market performance and public policy.

115. Government Regulation and Control of Business (3)
Prerequisite: B A 18. Role of government in regulation and control of enterprises and markets; legal principles and practices; case studies; analysis.

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118. Law and Business Activities (3) (Former Bus Ad 118B)
Prerequisite: B A 18. Law of bailments, shipments; sale of personal property; negotiable instruments; personal property security; case studies analysis.

119. Law of Business Organizations (3)
Prerequisite: B A 18 or equivalent. Law of partnerships, corporations, estates, wills, administration of estates, bankruptcy, debtor and creditor relations, surety; case studies analysis.

128. Business Environment of the Fine Arts (3)
Proseminar for seniors. Integration of principles of business management with production in the fine arts; case studies; analysis.

156. Labor Law (3)
Prerequisite: Econ 1A-B; B A 18, Mgt 110A-B. Proseminar in the law of industrial relations; historical and current principles for legal settlement of labor-management disputes; statutes, court decisions, administrative rulings; case studies; individual presentations.

184. Real Estate Law (3)
Prerequisite: B A 118 or equivalent. Legal aspects of acquisition and ownership of real estate; conveyances, mortgages, evidences of title; planning and zoning.

189T. Topics in Business Administration (1–3; max total 9 if no topic repeated)
Prerequisite: senior standing or permission of instructor. Studies in business administration.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

199. Supervised Work Experience (1; max total 4)
Open only to business administration majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; weekly analysis in class.

200 series. Graduate courses are listed under *Business.*

FINANCE (Fin)

34. Personal Investments (3)
Alternative uses of personal savings; stocks, bonds, mortgages and other securities, mutual funds, credit unions, banks, savings and loans, real estate investment trusts, insurance; financial security; mathematics of finance.

104. Business Forecasting (3) (Former B A 104)
Prerequisite: B A 100, Fin 135, Q M 103. Business activity analysis; methods of forecasting; general and specific forecasts; analysis of trends in product groups, sectors, regions, and other areas of the world economy; mathematical models and statistical decisions; analysis of case problems.

132. Financial Institutions (3) (Former B A 132)
Prerequisite: Econ 1A-B, Acct 4A-B. Theory of the financial system; intermediation; gross and net money doctrines; financial institutions; money and capital markets; mathematical models, simulation, case problems.

133. Business Finance (3) (Former B A 133)
Prerequisite: Econ 1A-B; 4A-B. Theory of financing the business firm under uncertainty. The supply of and demand for capital; asset management, simulation problems, capital structure analysis, cost of capital, capital budgeting decisions, mathematics of finance.

134. Security Analysis (3) (Former B A 134)
Prerequisite: Fin 133. Analysis of security markets; financial mathematics; stocks, bonds and mortgages; fundamental analysis; public and private regulation of security markets.

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135. Monetary Theory and the Banking System (3) (Former B A 135)
Not open to students with credit in Econ 135. Prerequisite: Econ 1A-B. Monetary theory, commercial banking, central banking; the Federal Reserve system; the international monetary system; mathematical models of money flows.

137. Credit Management (3) (Former B A 137)
Mercantile and consumer credit; derivation of credit information from business data; credit agencies and credit bureaus; valuation; analysis of financial statements; technical and legal problems; collections.

139. Proseminar in Financial Management (3) (Former B A 139)
Prerequisite: senior standing, B A 100, Q M 103. Undergraduate seminar integrating analysis and policy at management level of financial organizations; decisions under uncertainty; mathematical models and simulation.

143. Risk and Insurance (3) (Former B A 143)
Prerequisite: B A 8 or 18 (may be taken concurrently). Fundamental principles of insurance; risk aversion, actuary statistics, property and casualty insurance and insurance carriers.

144. Life Insurance (3) (Former B A 144)
Prerequisite: B A 8 or 18 (may be taken concurrently). Nature and use, scientific basis, types and forms of life insurance; organization, management; public regulation and control.

180. Real Estate Principles and Practice (3) (Former B A 180)
Prerequisite: Econ 1A-B. Theory and practice of urban land use. Location and legal dimensions, planning and market processes; financial and investment decisions in real estate; case analysis.

181. Real Estate Appraisal (3) (Former B A 181)
Prerequisite: Fin 180. Theory of real property value; historical development; methods used in urban and rural property appraisals; special purpose appraisals. Field work required.

183. Real Estate Finance and Investment (3) (Former B A 183)
Prerequisite: Fin 180. Financial analysis, pricing, acquiring, managing, and marketing the real estate investment.

186. Urban Land Economics (3) (Former B A 186)
Prerequisite: Fin 180. Metropolitan and regional growth analysis, population pressures and urban land use patterns, planning, and investment decisions.

189T. Topics in Finance and Industry (1–3; max total 9 if no topic repeated)
Prerequisite: senior standing or permission of instructor. Studies in business including agricultural economics, business economics, business law, finance, real estate and urban economics.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

199. Supervised Work Experience (1; max total 4)
Open only to business majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 Series. Graduate courses are listed under *Business.*

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MANAGEMENT AND MARKETING DEPARTMENT

Professors: Kruger (Chairman), R. Allen, Hampton, Jepsen, Mead, Piersol, Reighard, Swanson, Weinstock

Associate Professors: D. Anderson, Erb, Simpson, Wetmore, Worsley

Assistant Professors: Ashour, Barnouti, Cords, Reynolds, Trester, Wheeler

Lecturer: Brock

Part-Time: Halper, Kehlenbeck, L. E. Smith

MAJOR IN BUSINESS ADMINISTRATION

School of Business Core Requirements (A through E)

See *School of Business*—BS Degree in Business Administration.

Departmental requirements for Area E:

General Administration Option. Fin 104, Mgt 120. (See also Mgt 102)

Personnel and Industrial Relations Option. Ind R 159, Mgt 120. (See also Mgt 102)

Marketing Option. Mkt 109. (See also Mgt 102)

Transportation and Physical Distribution Management Option. Mgt 120, 148. (See also Mgt 102)

General Administration Option	*Units*
Ind R 150	3
O Ad 105	3
Elect: 12 approved upper division units from one of the following areas or 6 units from each of two areas: Accounting, Business Administration, Finance, Industrial Relations, Management, Marketing, Office Administration, Quantitative Methods.	12
	18
General electives	21
	39

Personnel and Industrial Relations Option	
Ind R 150, 152	6
Elect from: B A 156, Ind R 153, 154, 189T (appropriate section), O Ad 105, Econ 150, 151, Psych 145, 181	12
	18
General electives	21
	39

Marketing Option	
Mktg 101, 104	6
Elect from: Fin 104, Mgt 146, 147, Mktg 117, 130, 140, 142, 150, 155, 176, 189T, O Ad 105, Ag Ec 172	12
	18
General electives	21
	39

Transportation and Physical Distribution Management Option	
Mgt 146, 147	6
Elect from: B A 115, Fin 104, Ind R 152, Q M 63, Mgt or Mktg or Ind R 189T (appropriate section), Mktg 104, 176, Acct 128, Geog 102, O Ad 105	12
	18
General electives	21
	39

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COURSES

INDUSTRIAL RELATIONS (Ind R)

150. Administration of Personnel (3) (Former B A 150)
Prerequisite: Mgt 110A-B or 110. Acquisition and utilization of human resources in organizations: recruitment; selection; performance appraisal; motivation; compensation; communications; role of government. Lecture-discussion; individual and group projects; written and oral reports.

152. Labor Relations and Collective Bargaining (3) (Former B A 152)
Prerequisite: Mgt 110A-B or 110 or Econ 150. Relations between employers and organized employee groups; organization, election, and certification procedures; techniques of collective bargaining; labor agreements; grievance handling; settlement of industrial disputes.

153. Management Development (3) (Former B A 153)
Prerequisite: Mgt 110A-B or 110. Knowledge and skills leading to effective interpersonal relations; understanding one's self as leader and others as individuals and members of working groups; leadership practice and decision making as individuals and small groups.

154. Wage and Salary Administration (3) (Former B A 154)
Prerequisite: Mgt 110A-B or 110, Ind R 150 or permission of instructor. Economic forces and institutional factors in wage determination; wage programs; job evaluation; wage payment methods; wage supplements.

159. Problems in Manpower Management (3) (Former B A 159)
Prerequisite: Ind R 150, 152. Manpower policy formulation and decision making; labor market analysis; governmental manpower policy; methodology and application of manpower research. Individual and group research projects; case analysis and presentation; computer applications.

189T. Topics in Industrial Relations. (1–3; max total 9 if no topic repeated)
Prerequisite: senior standing or permission of instructor. Studies in personnel and labor relations: recruiting and selection, motivation, compensation, training, evaluation, labor organizations, collective bargaining, government and industrial relations, special problems in industrial relations.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

200 series. Graduate courses are listed under *Business.*

MANAGEMENT (Mgt)

101. Basic Management Block (12)
Meets School of Business requirements for Mgt 110A-B, 124, Mktg 100. Not open to students with credit in Mgt 110A-B, 110, 124, Mktg 100. Prerequisite: first-semester junior, Econ 1A-B, Acct 4A, Q M 65, application, and permission of instructor. Special integrative undergraduate seminar: 12 hours weekly; marketing, production, administration, organizational behavior. Small group projects; field trips and research; computer simulation; student planned and presented programs; business, government, academic guest presentations. Consult school or departmental office.

102. Advanced Management Block (12)
Meets 12 units of the following requirements: (a) Area E requirement for all options except accounting, (b) School of Business social science requirement, (c) option requirements as indicated under the various options, (d) general electives. Prerequisite: senior, all major core requirements except Area E, application, and permission of instructor. Undergraduate seminar integrating business disciplines; decision models of local businesses, history of ideas, business simulations by computer, case analyses, student-planned programs, individual and group presentations with executives and academicians, field trips, negotiations, group projects.

110. Administration and Organizational Behavior (6)
Not open to students with credit in Mgt 110A or B. Combines Mgt 110A and B into an integrated, one-semester course, under one instructor. Extended use of small group work, individual research, and class presentation. (See Mgt 110A–B description for course content.)

110A–B. Administration and Organization Behavior (3–3) (Former B A 110, 110A–B, 151)
Organizational theory; structure and forms of organization, authority, leadership, group dynamics, policy formulation, conflict resolution, organizational control, theory of work and motivation, individual differences, communications, planning, development, evaluation, managerial processes, management of human resources. Lecture-discussion, individual and group projects and reports.

111. Contemporary American Business System (3) (Former EXP 141, B A 111)
Required of entering foreign students; open to foreign students only. Nature, scope, and structure of modern American business; internal and external environment of business enterprise and effects on conduct of business and society; familiarization with American teaching methods. (field trip)

120. Proseminar in Business Policy (3) (Former B A 120)
Prerequisite: second semester seniors only. Undergraduate seminar with emphasis on integration of business and behavioral disciplines in presenting solutions to case studies.

124. Production Management (3) (Former B A 124)
Prerequisite: Q M 65, Mgt 110A or 110. Production systems and problems; facility location and design; material handling; production planning and control; purchasing; inventory control; product development; quality control; methods analysis and job design; work measurement; quantitative methods in solution of production problems. Field trip required.

129. Association Management (3) (Former B A 129)
Prerequisite: Mgt 110A. Application of management theory and methods to nonprofit civic and service organizations; development of objectives; planning; organization; staffing; leadership; evaluation; case studies.

146. Transportation Management (3) (Former B A 107, 146)
Prerequisite: Econ 1A-B. Major modes for movement of goods and people; comparison of alternatives; carrier organization and management; rate structures; government regulation; effect of transportation on plant location, pricing, and markets; urban and national transportation problems.

147. Physical Distribution Management (3) (Former B A 109, 147)
Prerequisite: Mktg 100. Systems approach to physical distribution; traffic management; plant and warehouse location; inventory control; information flows and order processing; supply scheduling; total cost planning; organizational patterns.

148. Advanced Transportation Management (3) (Former B A 148)
Prerequisite: Mgt 146, 147, or equivalent. New tools and techniques in carrier management, physical distribution management, carrier-shipper cooperation; trends in intracarrier and intercarrier competition, pricing and regulatory philosophy; case problems; computer simulation; individual and group problem solving.

189T. Topics in Management (1–3; max total 9 if no topic repeated)
Prerequisite: senior standing or permission of instructor. Studies in management, organizational theory, organizational behavior, production, transportation, business administration, special management and organizational problems.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

200 Series. Graduate courses are listed under *Business.*

MARKETING (Mktg)

100. Principles of Marketing (3)
Primarily for juniors. Not open to students with credit in Mktg 10. Prerequisite: Econ 1A-B. Economic and social problems involved in moving goods and services from the producer to the consumer; major kinds of goods and services to be marketed; the institutions and agencies of distribution, and the series of functions involved.

101. Consumer Behavior (3)
Prerequisite: Mktg 100. Consumer motivation and behavior based on analysis of the findings of the behavioral sciences.

104. Proseminar in Marketing Research (3) (Former Mkt 108)
Prerequisite: Econ 1A-B; Mktg 100; Q M 65 (may be taken concurrently). Fundamentals of market and marketing analysis, research procedure, methods of analysis; individual and group problem analysis and presentation of results; computer simulation.

109. Marketing Problems (6) (Former Mkt 106)
Prerequisite: Mktg 104, and senior standing. Integration and application of marketing theory; decision making and decision models, class analysis; individual and small group research and presentations, computer simulation. Relationship of other business areas to marketing.

112. Product and Pricing Policies (3)
Prerequisite: Mktg 100. Policies and practices involved in developing and maintaining products, services, and prices.

115. Distribution Systems and Controls (3)
Prerequisite: Mktg 100. Planning, development, and control of distribution systems and supporting facilities.

117. Industrial Marketing (3)
Prerequisite: Mktg 100. Analysis of marketing systems serving business, industry, government, and other institutions; industrial procurement practices; individual and group problem research, analysis and presentation of results.

130. Retailing Management (3)
Prerequisite: Mktg 100. Management operations and functions of retailing organizations; structure, personnel, impact on the community; buying, pricing and selling of merchandise.

140. Advertising Principles (3)
Analytical approach to advertising as a broad social influence; functions in our culture; application as a marketing and communication force; individual and group problem analysis and presentation of results; individual field research.

142. Advertising Problems (3)
Prerequisite: Mktg 140. Advertising production and media problems; market research techniques; selection of campaign themes, copy preparation, art and layout. Field trips required.

150. Psychology of Personal Persuasion (3)
Prerequisite: Mktg 100. Behavioral science approach to personal selling. Emphasis on analysis of psychological aspects of consumer decision-making and consumer attitudes toward the salesman that affect selling success. Case analysis, individual and group presentations.

155. Sales Administration (3)
Prerequisite: Mktg 100. Techniques of personal persuasion; behavioral science methods; selection, training, and supervision of sales staff.

176. International Marketing (3)
Prerequisite: Mktg 100. Examination and evaluation of business policies and practices of firms engaged in world trade; the marketing area; organization, product, channels of distribution, marketing research, demand creation, and other management problems.

189T. Topics in Marketing (1–3; max total 6 if no topic repeated)
Prerequisite: senior standing or permission of instructor. Topics in advertising, consumer behavior, distribution, industrial procurement, marketing research, retailing, wholesaling.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

199. Supervised Work Experience (1; max total 4)
Open only to marketing majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 Series. Graduate courses are listed under *Business.*

OFFICE ADMINISTRATION DEPARTMENT

Professors: Haggblade (Chairman), Agnew, Wight
Associate Professors: Schramm, Sobolik
Assistant Professors: Coffey, Flam, MacMillan, Panico

MAJOR IN BUSINESS ADMINISTRATION

School of Business Core Requirements (A through E)
See *School of Business—BS Degree in Business Administration.*

Departmental requirement for Area E: Mgt 120 and Acct 140, or Mgt 120 and Q M 164, or O Ad 121 and Mgt 120.

Office Administration Option	*Units*
O Ad 4, 103, 105, 107	12
Q M 60	3
Elect from: O Ad 112 and 114, or 6 units from Acct 120A, 128, 132, B A 100, 118, Q M 63, 64, and 166	6
	21
General electives	18
	39

COURSES

OFFICE ADMINISTRATION (O Ad)

*** 1. Typewriting (2)**
Not recommended for students with one or more semesters of high school typewriting. Development of typewriting techniques and their applications to practical usage. (4 lab hours)

*** 2. Typewriting (2)**
Prerequisite: O Ad 1 or equivalent. Review of keyboard; use of the typewriter as a communication tool; refinement of typewriting techniques with personal and business applications. (4 lab hours)

*** 4. Office Production (3)**
Prerequisite: O Ad 1, or equivalent. Modern office production standards, planning, layout, execution; use of offset, mimeograph, and fluid duplicators; electric typewriters; advanced problems. (2 lecture; 2 lab hours)

16. Machine Calculation (2)
Basic operations in use of rotary and electronic calculators; programming of desk computer. (4 lab hours)

† 23. Gregg Shorthand (4)
Prerequisite: adequate typewriting ability. Mastery of theory; proficiency in reading, writing and transcribing shorthand.

103. Principles of Office Management (3)
Office management in business and industry; organization and control of office services; selection, training, and supervision of personnel; utilization of the computer and peripheral equipment in the office; improvement of office efficiency; office planning and layout; equipment and supplies.

* Not more than six units of credit in typewriting will be allowed toward any degree.
† Not more than ten units of credit in shorthand will be allowed toward any degree.

105. Business Communication (3)
Prerequisite: 3 units of English composition and junior standing. Business communication theory; analysis of communication alternatives; effective business writing and dictating; case studies.

107. Information Retrieval Systems (3)
Records organization, management, and control; basic principles and procedures of information storage and retrieval; impact of data processing on the records area. Observation of retrieval systems in business installations.

† 112. Advanced Shorthand (3)
Prerequisite: O Ad 23 or one year high school Gregg or equivalent. Review of theory and development of proficiency in writing and transcribing shorthand notes; speed and endurance in writing and transcribing shorthand notes.

114. Transcription (3)
Prerequisite: O Ad 112 or equivalent (may be taken concurrently). Transcription from shorthand and machine dictation; development of production standards for office transcription.

116. Office Appliances for Business Teachers (3)
Not open to students with credit in O Ad 4. Prerequisite: O Ad 1, or equivalent. For students working toward a standard secondary credential in business and those wishing to teach business subjects in community colleges. Operation of all modern business machines.

121. Office Services and Procedures (3)
Prerequisite: O Ad 114 or equivalent. Duties and responsibilities of executive secretarial positions.

189T. Topics in Office Administration (1–3; max total 6 if no topic repeated)
Prerequisite: 3 units in office administration or permission of instructor. Seminar in special areas of office administration: communications, management, records management, secretarial science.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

199. Supervised Work Experience (1; max total 4)
Open only to office administration majors. Prerequisite: permission of instructor. Supervised work experience in business and industry; analyzed in weekly class meeting.

200 Series. Graduate courses are listed under *Business,* below.

† Not more than ten units of credit in shorthand will be allowed toward any degree.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility)*

BUSINESS (Bus)

Note: Bus 202, 205, 208, 211, 214, 216, 218, 221, 224, and 227 are open only to graduate students holding degrees in fields other than business. Other 200 series courses are open only to graduate students in classified standing, except that teaching credential candidates may take Bus 280, 281, 282 in unclassified standing when approved by the Business Credential Adviser.

200. Seminar in Business Research (3)
Methods of research; applications to business problems.

201. Seminar in Managerial Economics (3)
Economic analysis of managerial problems; theory of the firm.

202. Economics for Business Decisions (3) (Former Bus 101G)
Not open to students with credit in Econ 1A-B. Microeconomic decisions; product, service, and factor markets; risk, uncertainty, and profits; macroeconomic framework of business decisions.

203. Seminar in Office Management (3)
Managerial control of office functions, services, and personnel; case studies.

205. Financial and Managerial Accounting (3) (Former Bus 105G)
Not open to students with credit in Acct 1A-B or 4A-B. Financial accounting; statement analysis and interpretation; transaction analysis; partnerships and corporations; taxation; financial reporting; managerial controls, information systems, budgeting; costs, capital budgets.

208. Quantitative Methods in Business (3) (Former Bus 108G)
Not open to students with credit in B A 65, 103, or Q M 65, 103. Statistical analysis in business, tests of hypotheses, time series, correlation analyses, index numbers, estimation models, and Bayesian statistics in business decision making.

210T. Seminar in Business Topics (3; max total 9 if no topic repeated)
Prerequisite: 9 units of 200 courses. Theory and developments in accounting, administration and organization, business education, communications, consumer economics, finance, industrial and regional studies, international business, law, management, marketing, personnel and industrial relations, quantitative studies, real estate and urban economics, records management, resource economics, risk and insurance, or transportation.

211. Legal Environment of Business (3) (Former Bus 115G)
Not open to students with credit in B A 115, 118, 119. Basic legal concepts; nature of the legal system, law of contracts, sales, negotiable instruments, agencies, partnerships, corporations.

214. Organization and Management Theory (3) (Former Bus 121G)
Not open to students with credit in B A 110 or Mgt 110 or 110A. Organizational theory, structure and forms of organization, authority, leadership, group dynamics, policy formulation; conflict resolution, organizational control.

215. Seminar in Public Policy and Enterprise (3)
Development of legal controls of business; constitutional problems; legal aspects of business organization; anti-trust laws and competition, securities regulation, consumer protection.

216. Production Analysis (3) (Former Bus 125G)
Not open to students with credit in B A 124, 165, or Mgt 124. Production theory and methods, production planning and control; methods analysis, work measurements; materials handling and control, plant location and layout; application of statistical techniques and electronic data processing; relationships with other functional areas of management.

218. Principles of Finance (3) (Former Bus 130G)
Not open to students with credit in B A 133 or Fin 133. Financial management problems and policies; role of commercial banks, institutional, and other investors; case studies.

220. Seminar in Business Policy (3)
Advanced problems in business policy; evaluation, determination, execution, administration, and control; policy objectives in integration of product, marketing, manufacturing, finance, and organization; analysis of administrative policy-making bodies and processes.

221. Marketing Organization and Policies (3) (Former Bus 145G)
Not open to students with credit in Mktg 100. Environmental factors for marketing, elements of marketing and marketing systems, marketing activities and strategies of the firm; evaluating marketing programs and systems.

223. Seminar in Organizational Behavior (3)
Problems of the individual and groups brought about by modern industrial organizations and techniques; motivations for work and cooperation between executives and different economic and social groups; analysis of effect of company policy on employee and public relations.

224. Manpower Management (3) (Former Bus 150G)
Not open to students with credit in B A 150, 151, or Ind R 150. Principles and methods for the acquisition and utilization of human resources in organizations; staffing; compensation and motivation; communications; employee evaluation, labor relations.

225. Seminar in Production Management (3)
Current production management theories and problems; critical analysis and review of present practices and theories.

227. Computers and Programming (3) (Former Bus 164G)
Not open to students with credit in B A 61, 62, 62A–B, or Q M 63 or 64. Programming languages; data processing, COBOL; FORTRAN; simulation, models; problems.

232. Seminar in Money and Capital Markets (3)
Prerequisite: Bus 218 or equivalent. Analysis of money and capital markets, their organization and role in economic activity.

233. Seminar in Business Finance (3)
Prerequisite: Bus 218 or equivalent. Critical review of theory and practice; supply and demand factors; sources and uses of business funds; management of financial assets; cost of capital; theory of financial structures; promotion; liquidation of firms; current trends; changing institutional environment.

240. Seminar in Marketing (3)
Prerequisite: Bus 221 or equivalent. Critical review of the literature of marketing, special reports and research dealing with marketing institutions and organization, and marketing functions.

242. Seminar in Marketing Management (3)
Prerequisite: Bus 221 or equivalent. Analysis of basic problems of marketing management and alternative methods of approaching these problems; case studies; use of statistics, economics, psychology, and other tools in directing marketing activities; relation of marketing to other areas of business administration.

250. Seminar in Personnel Management (3)
Prerequisite: Bus 224 or equivalent. Trends and problems in management-employee relationships; administrative action in selection, motivation, and development of personnel; relation of personnel administration to other areas of management; concentrated study by each student of a special phase of personnel work.

252. Seminar in Labor Relations (3)
Prerequisite: Bus 224 or equivalent. Current trends in labor relations theory and practice; labor relations systems; contract negotiations; dispute prevention and settlement; role of government; applications of behavioral sciences; individual research.

260. Seminar in Accounting Theory (3)
Prerequisite: Bus 261 or equivalent. Development of accounting theory; current accounting theory; areas of accounting theory where professional differences exist; AICPA research studies, governmental regulations, recent literature, and accounting classics.

261. Seminar in Accounting Control and Reporting (3)
Not open to students with credit in Acct 120A–B, 132. Prerequisite: Bus 205 or equivalent. Procedures for financial reporting, systems and internal control, interpretation of administrative reports; accounting control—statistical inference, budgetary planning, standard costs, differential cost analysis, profit volume relationships, data processing.

262. Seminar in Programming (3)
Prerequisite: Bus 227 or equivalent. Advanced techniques of sorting, file maintenance and information systems, controls and teleprocessing directed toward business applications.

263. Seminar in Cost Accounting (3)
Prerequisite: Bus 261 or equivalent. Advanced study of process and standard costs; overhead costs; budgeting; use of cost accounting data in economic analysis and managerial control; problems illustrating course material.

264. Seminar in Quantitative Analysis (3)
Prerequisite: Bus 208, 216, or equivalent. Quantitative analysis of business problems; development of models, simulation and matrices; applications.

265. Seminar in Information Systems (3)
Prerequisite: Bus 227 or equivalent. Analysis of integrated and decentralized systems related to business organizations, their decision and control centers; underlying technologies and methods for designing, implementing, and operating an information system.

266. Data Processing Management and Computer Selection (3)
Prerequisite: Acct 128 or equivalent. Theories, costs, and problems of operating computer centers: standards, flow of work, scheduling, batching, spooling, multiprogramming techniques. In-depth study of hardware and software of various computers; feasibility studies; comparisons of competitive systems; costs of reprogramming.

267. Sampling Design (3)
Prerequisite: Q M 103 and permission of instructor. Theory and applications of probability and sampling distributions; theory of point and internal estimations of means, proportions, ratios, totals; precision of estimation and sample designs; probability and nonprobability designs; simple, stratified, cluster, systematic, and Bayesian estimation.

268. Regression, Correlation, Factor Analysis (3)
Prerequisite: Q M 103 and permission of instructor. Conditional, marginal, and joint probability distributions; statistical dependence; simple, multiple, linear and nonlinear regression models; correlation analysis; analysis of variance and regression; introduction to Bayesian decision theory.

271. International Business (3)
Prerequisite: Bus 202 or equivalent. Principles of trade and finance; comparative business systems and national policies; organization and management of business enterprises under different national systems; cultural and environmental factors influencing business operations in various countries.

272. Seminar in International Finance (3)
Prerequisite: Bus 271 or equivalent. Theory and practice in international money and capital markets; foreign exchange; balance of payments; problems of adjustment; comparative financial systems.

275. Seminar in International Business (3) (Former Bus 270)
Prerequisite: Bus 271 or equivalent. Examination of the economic, social, and political environment for operation of the multinational enterprise; consideration of the policies, practices and problems of the firm in the international setting. Text, case, and literature analysis.

280. Seminar in Business Education (3)
Study of advanced problems in business education.

281. Instructional Procedures in Business Education (3)
Objectives, procedures, materials, and evaluation in the teaching of business subjects at the secondary school level.

282. Seminar in Business Curricula (3)
Objectives, principles, and curricula of business in secondary schools, and colleges and universities; evaluation and trends of current programs.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

291. Management Project (3)
Prerequisite: Bus 200, 220, 223, 261, or permission of instructor. Independent field analysis of an operating business firm or one of its principal functional areas. The managerial audit may be submitted to the faculty in lieu of a thesis.

292. Readings in Business (2–3; max total 6)
Prerequisite: Bus 200, 220, 223, 261, or permission of instructor. Individually directed readings in a field of special concern to the student's graduate program; appropriate reports and evaluation required. Individual conferences; no formal class meetings.

299. Thesis (2–4; max total 4)
Prerequisite: Bus 200, 220, 223, 261, or permission of instructor. See *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree. Elective for master of business administration and master of science.

IN-SERVICE COURSES

See *Course Numbering System.*

367. CPA Review (4)

380T. Topics in Business (2; may be repeated if no topic repeated)

381. Instructional Procedures in Vocational Business Education (2–3)

385. Bridging the Gap (2–4)

389. Workshop in Business Education (1–6; max total 6)

398. Business Internship (1–6; max total 6)

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SCHOOL OF EDUCATION

Ralph F. Evans, Dean

Department	*Chairman*
Elementary Education	Arne J. Nixon
Secondary Education	
Advanced Studies	Orley W. Wilcox
Coordinator, Graduate Programs	Morris L. Bigge (Fall) Raymond H. Harrison (Spring)
Coordinator, Secondary Student Teaching	M. Marty Santigian (Fall) Allen Hasson (Spring)
Coordinator, Elementary Student Teaching	Thelma M. Rea

The School of Education utilizes the resources of the college in the preparation of teachers, administrative officers, and special service personnel for elementary and secondary schools. Teacher education curricula are developed on the assumption that a teacher or administrative officer needs a broad and liberal education, and should be master of the subject or subjects he teaches. This training, which is supplemented by professional education, provides a knowledge of pupils, familiarity with teaching problems, and meaning to the subjects of instruction.

Under the terms of the Licensing of Certificated Personnel Law of 1961, as amended by the 1963 and 1965 sessions of the Legislature, the School of Education provides professional preparation in elementary teaching, secondary teaching, junior college teaching, pupil personnel services, special education, and administration and supervision.

The School of Education is organized on a departmental basis. Supporting services included in the school organization are the Curriculum Library, Children's Library in the College Library, Instructional Materials Center for Special Education, Reading Center, Teacher Education Office, and School Graduate Office.

COOPERATING PUBLIC SCHOOL DISTRICTS

The professional preparation programs of the School of Education utilize the services and facilities of a number of cooperating public school districts in the area for assignments in observation, student teaching, and internship. Teachers, administrators, consultants, and other personnel provide excellent opportunities for students to gain practical experience in the field. The school works closely with the public schools in planning and implementing credential programs.

The following school districts are currently cooperating in the college program:

Caruthers Union High School
Central Union High School
Ceres Unified School District
Chowchilla Elementary School District
Clovis Unified School District
Cutler-Orosi Joint Unified School District
Dinuba Joint Union High School
Fowler Unified School District
Fresno City Unified School District
Hanford Joint Union High School
Herndon Elementary School
Kerman Union High School
Kern Joint Union High School
Kingsburg Joint Union Elementary School District
Kingsburg Joint Union High School
Kings Canyon Unified School District
Lemoore Union High School
Los Banos Unified School District
Madera Unified School District
Madison Elementary School District
Mariposa Unified School District
Monson-Sultana Joint Union Elementary School
McKinley-Roosevelt Union School
North Fork Union Elementary School
Parlier Unified School District
Porterville Union High School
Porterville Elementary School
Queen of the Valley Academy
Sanger Unified School District
Selma Unified School District
Sierra Joint Union High School
Tranquility Union High School
Tulare County Department of Education
Visalia Unified School District
Washington Colony School District
Washington Union High School

STANDARD CREDENTIAL REQUIREMENTS

Since September 14, 1966, California school credentials have been issued only in compliance with the Licensing of Certificated Personnel Law of 1961 and the regulations of the State Board of Education based on that law.

Under the terms of the revised credential structure, five standard credentials authorizing public school service are established. The following is a partial list of the specializations under the standard credentials for which course work is available at Fresno State. For a complete list see the *California Administrative Code, Title 5,* Sections 6100–6590. Information regarding specific requirements for the credentials listed can be secured from the department indicated in the *School of Education.* See also section on *Degrees and Credentials.*

Credentialing under the provisions of the law and regulations described above will, in general, be available after July 1, 1972, only to persons who on that date have completed two years of college and who on that date are enrolled in a teacher education curriculum at an institution of higher learning approved for teacher education. Persons not meeting these criteria will qualify for credentials through programs and under regulations now being developed and established by the college and by the Commission for Teacher Preparation and Licensing as authorized by the *Ryan Act* of 1970.

The Standard Teaching Credential

With a Specialization in Early Childhood Education (See *Elementary Education Department*)

With a Specialization in Elementary Teaching (See *Elementary Education Department*)

With a Specialization in Secondary Teaching (See *Secondary Education Department*)

With a Specialization in Junior College Teaching (See *Secondary Education Department*)

Specialized Preparation Which May Be Substituted for a Minor

Teacher of Exceptional Children (See *Advanced Studies Department*)

Area of Mentally Retarded

Area of Speech and Hearing Handicapped

Restricted Credentials

Teacher of Educable Mentally Retarded Children

Teacher of Deaf and Severely Hard of Hearing Children

Speech and Hearing Specialist

The Standard Designated Subjects Teaching Credential

In Public Safety and Accident Prevention, including Driver Education and Driver Training Authorization (See *Health Science Department, in the School of Professional Studies*)

The Standard Designated Services Credential

With a Specialization in Pupil Personnel Services (See *Advanced Studies Department*)
Child Welfare and Attendance
Psychometry and Psychology
Pupil Counseling
School Social Work

With a Specialization in Health (See *Nursing Department, in the School of Professional Studies*)

Service as a Nurse

The Standard Supervision Credential

(See *Advanced Studies Department*)

The Standard Administration Credential

(See *Advanced Studies Department*)

MAJOR AND MINOR REQUIREMENTS FOR STANDARD TEACHING CREDENTIALS

Candidates for the standard teaching credential with specialization in elementary or secondary teaching must complete major and minor requirements in accordance with the outlines appearing below. For specific requirements in any area students should consult the school or department in which the work is offered.

Elementary Specialization (Minimum Requirements)

Majors	Minors
A. *Academic subject commonly taught in public elementary schools* (a) *Single subject:* 24 semester hours at upper division or graduate level, except for 28 in biological sciences; or (b) *Interdepartmental:* 24 semester hours at upper division or graduate level; or (c) *Diversified:* 88 semester hours.	No minor is required; one or more of the following may be taken if desired: 20 semester hours in a single academic or nonacademic subject; or 20 semester hours in an academic interdepartmental group, including 12 in one subject; or An area of specialized preparation.
B. *Nonacademic single subject commonly taught in public elementary schools* 28 semester hours at upper division or graduate level.	20 semester hours in a single academic subject including 12 at upper division or graduate level; or 20 semester hours in an academic interdepartmental group including 12 in one subject at the upper division or graduate level
C. *Academic subject not commonly taught in public elementary schools* 24 semester hours at upper division or graduate level.	Two minors of 12 semester hours each, one academic. The other may be nonacademic or in an area of specialized preparation
D. *Nonacademic subject not commonly taught in public elementary schools* 24 semester hours at upper division or graduate level.	Two minors of 12 semester hours each, both academic.

Secondary Specialization (Minimum requirements)

Majors	Minors
A. *Academic subject commonly taught in public high schools* 24 semester hours of upper division graduate level work required for all majors.	No minor is required; one or more of the following may be taken if desired: 20 semester hours in a single academic or nonacademic subject; or 20 semester hours in an academic interdepartmental group, including 12 in one subject; or An area of specialized preparation.
B. *Nonacademic subject commonly taught in public high schools*	20 semester hours in a single academic subject, including 12 at upper division or graduate level; or 20 semester hours in an academic interdepartmental group, including 12 in one subject, of which 6 are upper division or graduate.

C. Academic subject not commonly taught in public high schools.	Two minors of 20 semester hours each, one academic. The other may be nonacademic or in an area of specialized preparation
D. Nonacademic subject not commonly taught in public high schools	Two minors of 20 semester hours, both academic, (20 semester hours in a single academic subject, or 20 in an interdepartmental group with 12 in one subject constitute a minor.)

At the present time the *California Education Code, Section 13188,* defines academic subject matter areas as the natural sciences, the social sciences, humanities, mathematics, and fine arts. At Fresno State the majors so defined include general agriculture and business. To determine whether a major is in a subject area commonly taught in the public schools, consult the Elementary or Secondary Education Department chairman. For requirements in specialized preparation, see the *Advanced Studies Department.*

CREDENTIAL BASED ON DEGREE MAJOR IN EDUCATION

The bachelor's degree based on a major in education is no longer authorized by the college. Candidates for credentials who have previously earned the degree can qualify for California credentials on the basis of the completion of appropriate minors. The chairman of the department in which a credential is sought should be consulted.

Center for Urban Education: The Center for Urban Education is a multipurpose facility of Fresno State located in West Fresno. Utilizing aspects of the social science major, it is designed primarily to provide course work and on-school-site training for prospective teachers in designated "depressed" areas. Admission to CUE is limited to residents of the area, permission of the director, and formal admission to Fresno State.

APPLICATION FOR ADMISSION TO CREDENTIAL PROGRAMS

Students planning to undertake a program of studies leading to a credential must file with the School of Education, through its Teacher Education Office, an application for admission to the credential program. This should normally be done during the first semester of the junior year. Candidates for credentials entering the college as juniors, seniors, or graduate students should make application for admission to the credential program immediately following admission to the college.

Under normal circumstances students will not be permitted to enroll in any of the professional course work leading to any credential until official admission to the credential program has been granted.

Acceptance for a credential program does not guarantee the granting of the credential, nor does acceptance for one credential or specialization imply acceptance for another credential or specialization. Final admission to a credential program must follow admission to the college and to graduate standing, where appropriate.

The following minimum requirements must be met for acceptance in the programs of professional preparation. Additional criteria may be used for acceptance to programs leading to professional master of arts degrees.

1. **Academic Aptitude.** Students who fall below the percentile rank of 25 on the college aptitude and reading tests must demonstrate compensating strength in other areas listed in the following sections.
2. **Scholarship.** Candidates for credentials with elementary or secondary specialization must present a minimum grade-point average of 2.50 in the total college program. A grade-point average of not less than 2.0 must be maintained in all work taken at Fresno State.
3. **Professional Aptitude.** Ability to work with pupils, parents, and school officials must be demonstrated in field work assignments.
4. **Physical Fitness.** All candidates for public school credentials must secure medical clearance from the staff of the college Student Health Service before admission to a credential program is approved.
5. **Language Usage.** Habitual use of clear, correct, and appropriate language, both written and oral, is required, including demonstrated competency in composition. This

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requirement is met by securing clearance statements in writing from both the English and Speech Communication Departments. The School of Education Admissions Committee reviews cases in which questions arise relative to this requirement.

6. **Personality and Character.** Personal qualifications required for professional service are expected. These include appearance, dress, poise, force, vitality, social attitudes, cooperativeness, temperament, emotional stability, integrity, and such personal habits and manners as are not offensive to pupils, co-workers, and school patrons.
7. **Many-sided Interests.** Participation in community enterprises, discussions of social problems, reading, music, conversation, social contacts, clubs, hobbies, and travel are considered important.
8. **General Fitness for Teaching.** Weakness in the foregoing items, or evidence of unfavorable traits of character or personality, will disqualify a student from candidacy for a credential program. Each candidate must secure approval from the School of Education Admissions Committee to continue through any credential program; approval is granted upon satisfactory completion of all requirements listed above.

The School of Education Admissions Committee is responsible for admitting applicants to credential programs. Students who do not meet all of the criteria for admission to a credential program may submit written petitions to the chairman of the Admissions Committee requesting review of their applications.

ADMISSION TO MASTER'S DEGREE PROGRAMS

Additional requirements must be met by students seeking admission to the professional master's degree programs. For further information regarding these requirements, the School of Education Graduate Office, and the department offering the desired degree should be consulted. The School of Education Graduate Office maintains a record center for all students who are working toward the master's degree in the School of Education. It also maintains liaison between the School of Graduate Studies and departments in the School of Education offering master's degree programs. See *School of Graduate Studies.*

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ELEMENTARY EDUCATION DEPARTMENT

Professors: Nixon (Chairman), Dandoy, Haimbach, Henfling, J. Leavitt, Leslie, John E. Martin, T. Rea, Rippey, Sloan, C. Smith, Sparks

Associate Professors: G. Avery, Bradley, Brenner, Huggins, Lundberg, Nicklett, Reitman, Simpson, Stutzman, V. Taylor

Assistant Professors: Avedisian, Lark, Ogden, Rowe, Stull

Lecturers: Cady, Meeker, Osterberg, Toddhunter

Part-time: J. Harris, J. Lee, Wellfare

The Elementary Education Department provides professional preparation for the standard teaching credential with specialization in elementary teaching and/or specialization in Early Childhood Education. The department also offers a program leading to the master of arts degree in education with concentration in elementary teaching.

THE STANDARD TEACHING CREDENTIAL WITH SPECIALIZATION IN ELEMENTARY TEACHING AND/OR SPECIALIZATION IN EARLY CHILDHOOD EDUCATION

Candidates for the Standard Teaching Credential with Specialization in Elementary Teaching and/or Early Childhood Education must complete four years of college or university education with a baccalaureate degree. In addition, a fifth year of college or university postgraduate education consisting of upper division and/or graduate courses must be completed. The credential can be issued on the basis of a partial fulfillment of requirements upon the completion of the bachelor of arts degree and the required student teaching. Requirements for admission to the credential program are listed under *School of Education.* Completion of the college credential program entitles a candidate to the Standard Teaching Credential with appropriate endorsements, issued by the Commission on Teacher Preparation and Licensing.

Candidates for the Standard Teaching Credential with Specialization in Elementary Teaching and/or Early Childhood Education must complete the following requirements:

General Education

The general education requirements for credential candidates differ from those required for the degree. Forty-five semester units of course work are required including special requirements in English and mathematics. Course work in five of the following areas must be included:

1. Humanities, excluding foreign language for the purpose of this requirement but including a year of English. (See English requirement below.)
2. Social sciences (including study of United States Constitution).
3. Natural sciences.
4. Mathematics, requiring as a prerequisite an understanding and knowledge of geometry.
5. Fine arts.
6. Foreign language.

Special English Requirement: A year of English and a course in advanced composition are required. (See 1 above.) Students may meet the requirement by completing English 1, 20, and 134.

Special Mathematics Requirement: A course of at least three units in the arithmetic and algebra of the real number system is required. (See 4 above.) This requirement may be satisfied by (a) Mathematics 41 or 141, (b) a similar course with prerequisite of high school algebra and geometry, or (c) a college level course in calculus.

Majors

The candidate for the Standard Teaching Credential with Specialization in Elementary Teaching and/or Early Childhood Education should select a major from a subject matter area commonly taught in the public elementary schools. Majors classified as nonacademic, such as health science, home economics, industrial arts, and physical education, may be used as majors for the elementary credential, but the credential authorizes the holder to teach only in his major and minor fields. Majors in subject matter areas not commonly taught in the public elementary schools may be used if accompanied by two minors in subject matter areas

commonly taught in the public elementary schools. Students considering nonacademic majors or majors not commonly taught in the public elementary schools should consult the chairman of the Elementary Education Department. (See *School of Education—Major and Minor Requirements for Standard Teaching Credentials*)

Minors

A minor is not required of a candidate for the Standard Teaching Credential with Specialization in Elementary Teaching if he plans to teach in a self-contained classroom. A candidate with a nonacademic major must complete an academic minor. For details consult the chairman of the Elementary Education Department. (See *School of Education—Major and Minor Requirements for Standard Teaching Credentials*)

Professional Preparation

Specialization in Elementary Teaching

The minimum professional requirements necessary to qualify for the Standard Teaching Credential with Specialization in Elementary Teaching include 24–25 units. The required instruction in reading methods enacted by the 1968 Legislature is contained in the requirements listed below.

	Units
E Ed 105, 107A-B, 120T, 132A-B	22
Elect one course from: E Ed 100, S Ed 184, 186	2–3
	24–25

Specialization in Early Childhood Education

E Ed 100, 105, 120T, 132A-B 30

Specialization in Elementary Teaching and Early Childhood Education

E Ed 100, 105, 107A-B, 132A-B 37

Students are not permitted to enroll in any of the courses listed under professional preparation until official admission to the credential program has been granted.

Major in Child Development

An interdisciplinary major leading to the Bachelor of Science Degree in Child Development is offered by Fresno State. See *Special and Interdisciplinary Programs.*

MASTER OF ARTS DEGREE

The Elementary Education Department offers a program leading to the master of arts degree in education with a concentration in elementary teaching. Emphasis is on developing highly qualified professional personnel for the elementary schools. Prospective candidates can usually plan to coordinate many of the requirements for the master of arts degree in education with the fifth year which must be completed by every candidate for a standard teaching credential. A student may enter the master's degree program following completion of fifteen semester units of acceptable work in professional education or following completion of the minimum requirements for a standard teaching credential, provided all criteria for classified graduate standing have been met. Students must also comply with policies and procedures established by the School of Education Graduate Committee.

For specific requirements consult the department chairman; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

COURSES

ELEMENTARY EDUCATION (E Ed)

50. Preprofessional Orientation (2; max total 4)

Orientation to problems and practices in professional education via working assignments in the public schools.

100. School and Society (3)
Prerequisite: admission to credential program (concurrent enrollment in E Ed 131T allowed). Function of education in American culture; role of the school and teacher; impact of social conflict on the school's function; relationship between school and community; designated field experiences.

105. Development and Learning (3)
Prerequisite: admission to credential program (concurrent enrollment in E Ed 131T allowed). Facts, ideas, and principles fundamental to an understanding of educational procedures in teaching and learning, and to the growth and development of children.

107A. Proseminar in Curriculum and Instructional Materials (3)
Prerequisite: E Ed 105, 132A (concurrently); admission to credential program. Current conceptions of reading, spelling, written and oral communications; their roles in the elementary curriculum.

107B. Proseminar in Curriculum and Instructional Materials (4)
Prerequisite: E Ed 107A, 132B (concurrently); admission to credential program. Current conceptions of history, geography, civics and the sciences; their roles in the elementary curriculum.

120T. Problems in Elementary Education (3; repeatable with different topics)
Prerequisite: admission to credential program; E Ed 105. Study in depth of various areas in elementary education including social studies, reading, culturally disadvantaged, kindergarten, children's literature, childhood education, mathematics, nursery school, language arts, classroom organization and management, curriculum, tutorial reading, storytelling, reading disability.

122F. Field Work in Outdoor Education (1–2; max total 2)
Prerequisite: E Ed 105 or S Ed 152; permission of instructor. Practice at camp with responsibilities of counseling, camp leadership, curriculum planning and evaluation; and utilization of resource people from several disciplines.

126. Directed Observation for Teachers (1–4; max total 6)
Does not duplicate E Ed 131T. For teachers in service, primarily provisionally credentialed teachers. Directed observation to accompany theory classes.

131T. Observation and Participation (1; max total 3)
Prerequisite: permission of instructor. Directed observation and participation to prepare for teaching, develop traits and qualities for successful teaching, provide basic experiences for interpreting educational theories. These include tutorial field experience, psychological foundations observations, sociological foundations observations, field work in outdoor education.

132A. Student Teaching in Elementary Schools (3)
Prerequisite: E Ed 107A (concurrently); admission to credential program. Observation and participation and a minimum of 45 clock hours of directed teaching with one hour conference weekly.

132B. Student Teaching in Elementary Schools (2–12)
Prerequisite: E Ed 132A or equivalent; one semester residence; admission to credential program. Directed teaching, participation, and teaching in public schools under supervision. One unit of credit equivalent to 22.5 clock hours of directed teaching.

135. Audio-Visual Education (2) (Same as S Ed 135)
Prerequisite: E Ed 105. Types and use of materials and equipment in the classroom; laboratory work in operation of equipment and appraisal of materials.

137. Creative Dramatics (2) (See Drama 137)

141. School Library Reference and Bibliography (3) (Same as S Ed 141)
Evaluation and use of basic reference tools found in the school library; selection, critical evaluation, and sources.

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142. Selection and Uses of Library Materials (3) (Same as S Ed 142)
Selection and use of materials for school media centers according to the needs of children and the educational goals of the school program.

143. Literature for Young People (3) (Same as S Ed 143)
Survey of selected materials appropriate to the needs, interests, and abilities of young people. Use of books for curricular, leisure, and guidance purposes, practice in reviewing media and in giving book talks.

144. Advanced Cataloguing (3) (Same as S Ed 144)
Extensive practice in cataloguing, with emphasis upon resources requiring special description, such as audio-visual, resource material, and pamphlets.

145. Practicum (9) (Same as S Ed 145)
Observation and practice work in selected school libraries; includes at least 180 clock hours of supervised library experience under the supervision of a credentialed librarian.

146. In-Service Child Study (1–2; max total 4)
Prerequisite: E Ed 105 or Psych 119, teaching experience. Child-study skills and techniques adaptable for use by the regular classroom teacher; methods of studying individuals in classroom groups; case studies.

147. Administration of School Library Services (3) (Same as S Ed 147)
Prerequisite: admission to credential program or permission of instructor. The materials-centered library; effective organization and maintenance based on standards, aims, and policies for the library in relation to curriculum; budgeting, reporting, and evaluating.

148. Organization of School Library Materials (3) (Same as S Ed 148)
Prerequisite: E Ed 147 and admission to credential program or permission of instructor. Acquisition, cataloging, classification, and allied processes for a materials-centered school library. Practice in cataloging and classifying library materials; development of a sample catalog.

149. The School Library as an Educational Force (3) (Same as S Ed 149)
Prerequisite: E Ed 148 and admission to credential program or permission of instructor. Depth study of the role of the school library; functions, aims and policies for libraries in relation to curriculum, teachers, and children.

157. Conservation of Natural Resources (3) (See Biol 157)

158. Communication in the Classroom (3) (See Spch 114)

175. Seminar and Practicum in Elementary Teaching (6–8)
Prerequisite: baccalaureate degree (concurrent registration in E Ed 267 required), or permission of instructor. On-school-site seminar and practicum to train teachers for service in economically depressed areas. Growth and development, principles of learning, curricular and methodological focus on language development and reading.

176. Seminar and Practicum in Elementary Teaching (6–8)
Prerequisite: E Ed 175 (concurrent registration in E Ed 267 required). On-school-site seminar and practicum to train teachers for service in economically depressed areas. Relationship between school and community; scope and function of elementary school. Curricular and methodological focus on social studies, science, and mathematics.

180. Modern Trends in Education (1–4; max total 4) (Same as S Ed 180)
Recent trends in educational objectives; selection and revision of curricular materials; methods of instruction.

185. In-Service Curriculum Development (1–4; max total 4) (Same as S Ed 185)
Prerequisite: E Ed 105, or S Ed 152 teaching experience. Methods of evaluating and improving curriculum on problems identified by the participants; problems may be systemwide or involve only one subject in one school.

190. Independent Study (1–3; max see reference)
(See *General Information—Independent Study*.)

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

211. Issues in Teaching Social Sciences in the Elementary School (3)
Prerequisite: E Ed 107B, graduate standing or permission of instructor. Seminar in study of selected curricula; planning curriculum in social sciences; problems related to social sciences in a changing society; project required.

212. Diagnosis and Correction of Reading Disabilities (3)
Prerequisite: E Ed 120T, graduate standing; Psych 111 recommended. Causes of reading disabilities; observation and interview procedures; diagnostic instruments; standard and informal tests; materials and methods of instruction.

213. Language in the Elementary School (3)
Prerequisite: E Ed 107A, graduate standing or permission of instructor. Seminar in the study of the English language arts. Objectives, curriculum, materials, and research in oral and written communication; project required.

214. Children's Literature (3)
Prerequisite: E Ed 107A, graduate standing, or permission of instructor. Seminar in children's literature; critical interpretation of children's literature; emphasis upon impact of changing social and cultural patterns in books for children; project required.

219. Practicum in Reading Disabilities (3)
Prerequisite: E Ed 212 or permission of instructor. Laboratory experiences in the diagnosis and correction of reading disability cases under supervision.

220. Research in Education (3) (See A S 220)

221. Early Childhood Education (3)
Prerequisite: E Ed 105, graduate standing, or permission of instructor. Seminar in early childhood education; philosophical and sociological development of early childhood education; alternate philosophies and programs; current trends and controversial issues; project required.

250. Elementary School Curriculum Development (3)
Prerequisite: teaching credential or permission of instructor. Seminar on concepts and principles of curriculum planning; evaluation of processes and programs; availability and use of resources; innovations and research in curriculum development. Project required.

252. Supervision and Curriculum in Reading (3)
Prerequisite: E Ed 250 and permission of instructor. Study of selected curricula; planning curriculum in reading; effective ways of dealing with the functions and duties of reading supervisors and consultants.

267. Teaching Internship (3–12)
Prerequisite: approval by departmental admission and internship committees, E Ed 132A, E Ed 268 (concurrently). One-half day teaching experience with contract for one school year under supervision of college and assigned district personnel.

268. Seminar for Interns (2–4; max total 4)
Prerequisite: E Ed 267 (concurrently). Curricular and instructional materials and procedures with emphasis upon internship assignment.

275. Workshop in Curriculum Development (1–6; max total 6) (Same as S Ed 275)
Practical assistance in solving curriculum problems; problems determined by in-service teachers enrolled.

280. Current Problems in Elementary Education (3)
Prerequisite: possession of a standard teaching credential or permission of instructor. Problems of teaching in the public elementary school; recent reports of national professional groups; newly developed research; significant movements in education.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

298. Seminar in Elementary Teaching (3–6; max total 6)
Prerequisite: advancement to candidacy for MA degree; B average on 24 units of MA program including E Ed 220 and 6 units on Fresno campus. Research in solution of problems in elementary teaching. Individual research papers required. Weekly group discussions, weekly individual conferences, and hours arranged.

299. Thesis (3–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

353. Curriculum Problems and Practices (1–3; max total 12 if no topic repeated)

380T. Topics in Education (1–3; max total 12)

381. Planning and Organizing Outdoor Education (2)

383. Problems in Child Study (2; max total 12)

395. Supervision of Student Teachers (2; max total 4) (See S Ed 395)

SECONDARY EDUCATION DEPARTMENT

Professors: Ballou, Bigge, W. Gilbert, Hunt, L. Roth, Santigian, Swineford
Associate Professor: Hasson
Assistant Professor: Quirk
Lecturers: Holland, Pengilly
Part-time: Farley, Harris

In addition to coordinators listed below, who act as official liaison between the subject matter department and the Department of Secondary Education, there may be departmental supervisors and advisers in the major and minor for secondary credential candidates. They advise on credential matters, teach methods courses in their subject fields, and supervise student teachers.

Department	*Department*
Agriculture: Dowler	Industrial Arts and Technology: Bliss
Art: Dolarian	Journalism: J. Tucker
Biology: D. Falk	Mathematics: Pengilly
Business: Schramm	Music: Bakkegard
Chemistry: Vavoulis	Physical Education—Men: J. Wilcox
Drama: R. W. Smith	Physical Education—Women: Mott
English: Karr	Physical Science: Pengilly
Foreign Language: R. Poythress	Psychology: Powell
Geography: Koller	Social Science: J. Christensen, Echols
Health Science: Fricker	Speech: G. Anderson
Home Economics: Bauer	

The Secondary Education Department provides professional preparation, advising, and evaluating services to students in secondary education. General responsibility for the standard teaching credential with specialization in secondary teaching is assigned to this department. Information is also available regarding junior college teaching. The department includes in its program the master of arts degree in education with concentration in secondary teaching.

THE STANDARD TEACHING CREDENTIAL WITH SPECIALIZATION IN SECONDARY TEACHING

Candidates for the Standard Teaching Credential with Specialization in Secondary Teaching must complete four years of college or university education with a baccalaureate degree. In addition, a fifth year of college or university postgraduate education consisting of upper division or graduate courses must be completed. Requirements for admission to the credential program are listed under *School of Education.* Completion of the college credential program entitles a candidate to the Standard Teaching Credential with appropriate endorsements, issued by the Commission on Teacher Preparation and Licensing.

Candidates for a Standard Teaching Credential with Specialization in Secondary Teaching, authorizing assignment in grades 7 through 12 in major and minor subjects, must complete the following requirements:

GENERAL EDUCATION

The general education requirements for credential candidates differ somewhat from those required for the bachelor's degree. Forty-five semester units of course work are required of secondary credential candidates. Course work must be taken in at least *four* of the six areas included in the following list. Not more than six semester units of course work taken to satisfy this requirement shall apply toward the fulfillment of the requirements for a major or a minor. The degree general education requirements are listed in the section on *Degrees and Credentials.*

1. Humanities, excluding foreign language for the purpose of this requirement, but including English.
2. Social Sciences (including study of the United States Constitution).

3. Natural Sciences.
4. Mathematics, requiring as a prerequisite an understanding and knowledge of high school algebra and geometry.
5. Fine Arts.
6. A Foreign Language: This requirement may be satisfied by passing an examination given without college credit.

MAJORS AND MINORS

Candidates for the Standard Teaching Credential with Specialization in Secondary Teaching must complete one of the following.

1. A major in an academic subject commonly taught in the public high schools.
2. A major and a minor, each of which is in a subject matter area commonly taught in the public high schools, and one of which is in an academic subject matter area.
3. Two minors in subject matter areas commonly taught in the public high schools, and a major not commonly taught in the public high schools. If the major is nonacademic, both minors must be in academic subjects. If the major is in an academic subject, then one minor shall be in an academic subject.

For a detailed outline of major-minor options see *School of Education—Major and Minor Requirements for Standard Teaching Credentials.*

Majors

1. Single Subject: Twenty-four upper division or graduate semester units, six of which are taken in graduate level courses. If six semester units are taken in graduate level courses in the minor, the requirement does not apply to the major. For purposes of this requirement, each of the following, among other subjects, is considered to be a single subject:

a. Agricultural Science
b. Biological Sciences
c. Business Education
d. Health Science
e. Home Economics
f. Industrial Arts
g. Nursing Education
h. Physical Education

2. Interdepartmental: Twenty-four upper division or graduate semester units, at least fifteen of which must be in one of the subjects constituting the interdepartmental major. Interdepartmental majors may be offered in the following subject matter areas:

a. Physical Sciences
b. Social Sciences (including Latin American Studies)
c. Humanities
d. Biological Science or Physical Science, and Mathematics
e. Fine Arts

Minors

1. Single Subject: Twenty semester units in a subject normally taught in the public high schools. When the major is classified as nonacademic, 12 semester units of upper division or graduate work must be taken as part of the minor.

2. Interdepartmental: Twenty semester units in two or more subjects in any one of the academic subject matter areas listed under *Interdepartmental Majors* above. Twelve semester units must be earned in one of the subjects included in the interdepartmental minor. When the major is classified as nonacademic, 6 of the 12 semester hours taken in one subject must be at the upper division or graduate level.

3. Special Education: Specialized preparation to teach exceptional children may be substituted for the minor when the major is in an academic subject matter area (see *Advanced Studies Department*).

PROFESSIONAL PREPARATION

The minimum professional requirements necessary to qualify for the Standard Teaching Credential wth Specialization in Secondary Teaching include courses in the categories listed below, including 6 units of student teaching. This sequence meets the state minimum requirements for the standard teaching credential with secondary specialization. Students

may select additional courses from the recommended electives indicated below.

	Units
S Ed 151, 152, 153	9
S Ed 161 or equivalent (see below)	2–3
S Ed 166	6
	17–18

Recommended Electives: S Ed 135, 150, 154, A S 154, 174, 284.

Equivalent Departmental Methods Courses: Ag Ed 186, an approved section of Art 120T, Bus 281, H Ec 140, Ind A 192, Jour 131, Music 156, PE 161.

THE COMMUNITY COLLEGE INSTRUCTOR CREDENTIAL

The Community College Instructor Credential, authorizing instruction in grades 13 to 14, inclusive, is issued by the Credentials Section of the Office of the Chancellor, California Community Colleges (825 Fifteenth Street, Sacramento, California, 95814). Information relative to credential requirements may be obtained from the Chancellor's Office. Courses offered in the Secondary Education Department may be utilized to satisfy credential requirements. Consult the Chairman of the Department of Secondary Education.

MASTER OF ARTS DEGREE

The Secondary Education Department offers a program leading to the master of arts degree in education with a concentration in secondary teaching. Emphasis is on developing highly qualified professional personnel for the secondary schools. Prospective candidates can usually plan to coordinate many of the requirements for the degree with the fifth year of work which must be completed by every candidate for a standard teaching credential. A student may enter the master's degree program following completion of fifteen semester units of acceptable work in professional education or following the meeting of minimum requirements for a standard teaching credential, provided all criteria for classified graduate standing have been met. In addition, students must also comply with policies and procedures established by the School of Education Graduate Committee. For specific requirements consult the department chairman; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

COURSES

SECONDARY EDUCATION (S Ed)

135. Audio-Visual Education (2) (See E Ed 135)

141. School Library Reference and Bibliography (3) (See E Ed 141)

142. Selection and Uses of Library Materials (3) (See E Ed 142)

143. Literature for Young People (3) (See E Ed 143)

144. Advanced Cataloguing (3) (See E Ed 144)

145. Practicum (9) (See E Ed 145)

147. Administration of School Library Services (3) (See E Ed 147)

148. Organization of School Library Materials (3) (See E Ed 148)

149. The School Library as an Educational Force (3) (See E Ed 149)

150. Observation and Participation (3)

Prerequisite: admission to credential program or permission of instructor; S Ed 151 concurrently. Guided observation and participatiôn in public school services programs and procedures.

151. Cultural Foundations of Education (3)
Prerequisite: admission to credential program. Education in the United States, philosophical influences, socio-economic factors, educational developments and trends; professional basis of teaching; scope, function, and desirable outcome of public education; current educational issues.

152. Psychological Foundations of Education (3)
Prerequisite: admission to credential program. Educational psychology; theories of growth and learning; concepts of growth, learning, mental hygiene, and personality development; implications for instruction and guidance programs.

153. Curriculum and Instruction (3)
Prerequisite: S Ed 152, or equivalent. Theory and practice of curriculum development; principles and organization of instruction; audio-visual education, classroom management and discipline, measurement and evaluation.

154. Developmental Reading in Secondary Schools (3)
Prerequisite: S Ed 152. Reading process for secondary teachers as it relates to all subjects in the secondary school; facility in language arts communication, use of symbol. Experience with reading technology.

161. Methods and Materials in Secondary Teaching (2–3)
Prerequisite: S Ed 152 or equivalent, admission to credential program or teaching experience. A special methods course in major and minor subjects. Instructional procedures, techniques, and resources for teaching; appraisal of instructional innovations; classroom organization and management; measurement and evaluative techniques.

164T. Educational Practices (1; max total 3 if no topic repeated)
Prerequisite: S Ed 152 or permission of instructor. Skill-development laboratory in audio-visual equipment, case studies, test construction.

166. Student Teaching: Secondary (1–12)
Prerequisite: admission to credential program, one-semester residence, S Ed 150, 151, 152; completion of major, S Ed 153 prior to or concurrently with respective student teaching assignments. Supervised observation, participation, and teaching in public schools; minimum of 60 clock hours of actual teaching for each three units of credit. Scheduled conferences with college supervisors and supervising teacher.

167. Teaching Internship (3–12)
Prerequisite: Baccalaureate degree, approval of departmental admissions and internship committees, one semester residence, S Ed 166 (3 un), 168 (concurrent), completion of credential major. One-half day teaching under contract for one school year in secondary school or community college, supervised by assigned college and district personnel.

168. Seminar for Interns (2)
Prerequisite: S Ed 167 (concurrent). Curriculum and instructional materials and procedures in secondary teaching with emphasis on internship assignment; educational technology and measurement, evaluation of instruction.

175. Seminar and Practicum in Secondary Teaching (4–6)
Prerequisite: baccalaureate degree (concurrent registration in S Ed 167 required). On-school-site seminar and practicum to train teachers for service in economically depressed areas. Scope and function of secondary schools in American culture, socio-economic factors, educational trends, implications for curriculum and instructional techniques, methods and materials.

176. Seminar and Practicum in Secondary Teaching (4–6)
Prerequisite: S Ed 175 (concurrent registration in S Ed 167 required). On-school-site seminar and practicum for training teachers for service in economically depressed areas. Psychological foundations of educational practice, implications for guidance programs, curriculum and instructional techniques including audio visual and evaluation processes.

180. Modern Trends in Education (1–4; max total 4) (See E Ed 180)

184. History of Education in the United States (3)
Prerequisite: admission to credential program. Sources and development of modern American educational theory and practice; understanding and appreciation of educational development and reorganization now in progress.

185. In-Service Curriculum Development (1–4; max total 4) (See E Ed 185)

186. Educational Sociology (2)
Prerequisite: admission to credential program. Scope and methods of educational sociology; basic sociological concepts; problems involving child, school, and teacher in their cultural settings; social role of schools in a democratic society.

188. Issues in Educational Theory (2)
Prerequisite: teaching experience or permission of instructor. Relation of major philosophical positions to educational trends, issues, and procedures.

190. Independent Study (1–3; max see reference)
(See *General Information—Independent Study.)*

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

220. Research in Education (3) (See A S 220)

251. Seminar on Problems in Secondary School Reading (3)
Prerequisite: S Ed 152, 154, teaching experience or permission of instructor. Recommended: A S 174; educational measurements course. Nature of reading; observation and analysis of reading behavior and needs of secondary school pupils; development of reading materials and techniques for specific needs.

253. Secondary School Curriculum Development (3)
Prerequisite: teaching credential or permission of instructor. Seminar on concepts and principles of curriculum planning; evaluation of processes and programs; availability and use of resources; innovations and research in curriculum development. Project required.

258. The Community Junior College (3)
The junior college movement in America, with emphasis upon California; role of junior colleges; characteristics of junior college students and programs; problems of general and terminal education. Research paper required.

275. Workshop in Curriculum Development (1–6; max total 6) (See E Ed 275)

280. Seminar in Current Problems in Secondary Education (3)
Prerequisite: possession of a regular teaching credential or permission of instructor. Problems of teaching in the public secondary school; recent reports of national professional groups; newly developed research; significant movements in education.

282. Philosophy of Education (3) (Former S Ed 187. Same as A S 282)
Prerequisite: S Ed 152 or equivalent, teaching experience or permission of instructor. Seminar on philosophical issues in educational theory and practice and their historical backgrounds. Educational implications of current and historical systematic philosophical outlooks.

290. Independent Study (1–3; max see reference)
(See *General Information—Independent Study.*)

298. Directed Research (6)
Prerequisite: advancement to candidacy for the MA degree; B average on 24 units of MA program including S Ed 220 and 6 units on Fresno Campus. Research in solution of problems in secondary teaching. Individual research papers required. Weekly group discussions, weekly individual conferences; and hours arranged. Research paper required.

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299. Thesis (3–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

353. Curriculum Problems and Practices (1–3; max total 6, if no topic repeated)

361. General Methods of Teaching (3)

362. Adult Education (2; max total 4)

363F. Field Work in Curriculum (1–3; max total 6, if no project repeated)

380T. Topics in Education (1–3; max total 12)

395. Supervision of Student Teachers (2; max total 4) (Same as E Ed 395)

ADVANCED STUDIES DEPARTMENT

Professors: O. Wilcox (Chairman), R. F. Evans, Fast, Griffiths, R. H. Harrison, G. F. Johnson, Kremen, Mach, Valett, Wardle, Wilkin

Associate Professors: Brewer, Monke

Part-time: Barnett, Chapman, James, Sorensen

The Advanced Studies Department provides preparation for educational specializations which require advanced study beyond the teaching credential and maintains credential records for students pursuing programs leading to specialized service credentials in education. It offers the following master of arts degrees: (1) Education with a concentration in administration and supervision, (2) education with a concentration in educational theory, (3) counseling, and (4) special education. Information is available in the department on credentials in supervision, administration, and pupil personnel services and on specialized preparation for teachers of exceptional children.

COOPERATING PUBLIC SCHOOL DISTRICTS

The professional preparation program of the Advanced Studies Department utilizes the services and facilities of a number of cooperating public school districts in the area for assignment of students to specialized field work. Public school teachers, administrators, consultants, and other personnel provide excellent opportunities for students to gain practical experience in pupil personnel, special education, supervisory, and administrative work.

THE STANDARD SUPERVISION CREDENTIAL

The standard supervision credential authorizes the holder to serve as a supervisor, consultant, coordinator or in an equivalent supervisorial or intermediate administrative position at all grade levels and in all areas in which his credential authorizes him to teach or serve. The credential also authorizes the holder to serve as a principal of any school in which he is authorized to teach provided he holds either a valid standard teaching credential with a specialization in elementary, secondary, or junior college teaching or a valid general teaching credential, if his college or university preparation included a major in an academic subject matter area, or a diversified major in the case of a general elementary credential. See the department chairman for requirements for admission to the credential program.

REQUIREMENTS

The minimum requirements for the Standard Supervision Credential are as follows:

1. The possession of a valid teaching or service credential.
2. Five years of successful teaching experience in public elementary schools, secondary schools, or private schools of equivalent status.
3. A master's degree or other postgraduate degree requiring not less than five years of college or university work earned prior to or concurrently with the credential.
4. Six years of college or university education in an approved institution including two years of acceptable postgraduate work. The two years of acceptable postgraduate education shall include one of the following:

(a) Completion, under the direction of an approved institution, of a supervisory internship program approved by the State Board of Education. An internship program leading to the Standard Supervision Credential is available at Fresno State to candidates who have completed a master's degree or its equivalency and have five years of teaching experience. Issuance of the Standard Supervision Credential on the internship basis is subject to approval by the college and the school district in which the student is assigned administrative or supervisory duties on either a half time or full time basis. See the department chairman for information relative to qualifications for the internship program.

(b) Completion of a program for the preparation of school supervisory personnel in a college or university approved by the State Board of Education.

PROFESSIONAL PREPARATION

The program of professional preparation for this credential requires course work in accordance with the distribution listed below. The professional requirements cover approximately one of the two postgraduate years needed for The Standard Supervision Credential.

1. The organization and administration of school systems: A S 261, 264, 265, 266
2. Personnel administration: A S 262
3. Development and evaluation of instructional programs: A S 263, E Ed 250 or S Ed 253
4. Work related to specialized functions, including services as a principal or supervisor; appropriate courses from the following in consultation with the adviser: A S 154, 286, 287
5. Supervised field experiences: A S 268, 269
6. Electives: Sufficient units in education and related fields selected in consultation with the adviser to total the required program as indicated in *California Administrative Code, Title 5,* Section 6550.

THE STANDARD ADMINISTRATION CREDENTIAL

The Standard Administration Credential authorizes the holder to serve as a superintendent, assistant superintendent, or in an equivalent intermediate administrative position. The credential also permits service as a principal and supervisor at all grade levels provided the holder possesses a valid Standard Teaching Credential or a valid General Teaching Credential and his college or university preparation included a major in an academic subject matter area. See department chairman for requirements for admission to the credential program.

REQUIREMENTS

The minimum requirements for the Standard Administration Credential shall include the following stipulations:

1. Possession of a valid standard or general elementary, secondary, or junior college teaching credential other than a credential issued upon partial fulfillment of requirements or postponement of requirements and other than a provisional, limited, or exchange credential. Completion of academic majors required for the standard teaching credential with specialization in elementary, secondary, or junior college teaching.
2. A minimum of five years of successful full-time teaching experience in the public elementary or secondary schools, or in private schools of equivalent status.
3. Possession of a master's degree in an academic subject matter area, an acceptable equivalent of the master's degree, or the doctorate. If the doctorate is not in an academic subject matter area, the three years of acceptable postgraduate education shall include twenty-four semester hours of course work in academic subject matter areas.
4. Seven years of college or university education, or its equivalent in an approved institution, including three years of acceptable post baccalaureate upper division or graduate course work.

(a) The three years of acceptable postgraduate education shall include:

(1) Completion, under the direction of an approved institution, of an administrative internship program approved by the State Board of Education *or*

(2) Completion of a program for the preparation of school administrators in an institution approved by the State Board of Education, and whose program for the preparation of school administrators is accredited by the State Educational Certification Agency in the state or by the National Council for the Accreditation of Teacher Education.

PROFESSIONAL PREPARATION

The three years of acceptable postgraduate work shall include graduate course work in professional education and related fields as indicated below:

1. Legal and financial aspects of education: A S 264, 265, 266
2. School management: A S 267, 270, 271
3. Education and school administration in the community: A S 286
4. Staff development and advanced techniques of personnel management: A S 275
5. Curriculum development, evaluation and research: A S 272
6. Supervised field work experiences: A S 268, 269
7. Electives: sufficient units in education and related fields selected in consultation with the adviser to total the required program as indicated in *California Administrative Code, Title 5,* Section 6560.

THE STANDARD DESIGNATED SERVICES CREDENTIAL WITH A SPECIALIZATION IN PUPIL PERSONNEL SERVICES

A Standard Designated Services Credential with a Specialization in Pupil Personnel Services includes the following designated services: Pupil Counseling, Child Welfare and Attendance, Psychometry, Psychology, and School Social Work. Since the requirements differ for the various designations that may appear on the credential, and since only a brief summary of the requirements is included here, it is essential that the student planning to work toward this credential should consult the Department of Advanced Studies to secure an adviser as early as possible and be admitted to the credential program.

Requirements: The applicant shall have completed a program including the following:

(a) A baccalaureate or higher degree from an institution approved by the State Board of Education.

(b) A fifth year of college or university education. Except where inappropriate, the fifth year shall be substantially devoted to academic and clinical training suggested below.

(c) A S 153, Elementary Statistics, or an equivalent course is prerequisite to the program and is not to be counted in the units applied on the credential.

Professional Preparation: The total credential program at Fresno State College will consist of 33 units. Candidates for the Standard Credential in Counseling must complete 21 units of course work in the following areas:

A. Pupil Personnel Services, Concepts and Procedures
   A S 174, Principles and Techniques in Guidance
B. Counseling Theory and Procedures
   A S 224, Counseling Techniques or Psych 262, Diagnostic Clinical Interviewing
C. Measurement Theory and Procedures
   A S 227, Tests in Counseling
D. Education and Career Planning
   A S 222, Occupational Analysis and Information
E. Organization of Pupil Personnel Services
   A S 226, Organization and Administration of Guidance Services
F. Practicum and Field Work
   A S 224F, Field Work in Counseling, and A S 231, Counseling Practicum

An additional 12 units will be selected from the following areas:

G. Dynamics of Individual Behavior
   A S 229, Counseling in the Elementary School, or
   Psych 152, Abnormal Psychology
H. Group Processes, Theory and Procedure
   A S 228, Group Process in Pupil Personnel Services
I. Remedial and Special Education
   A. S. 160, Education of Exceptional Children, or
   A S 230, Guidance of Exceptional Children and Their Parents
J. Laws Relating to Children
   A S 172, Laws Relating to Children
K. Parent Education and Counseling
   A S 223, Child Welfare, Parent Education, and Counseling
L. Advanced Counseling Theory
   A S 225, Advanced Theories and Techniques in Counseling
M. Emotional and Social Adjustment
   A S 218, Mental Hygiene and Guidance of Children

For a student with ten units of acceptable course work, sufficient background experience, and employment, this program can be offered on an internship basis.

Students interested in psychometrist or psychologist credentials should consult the Psychology Department for an adviser. School Social Worker candidates should consult the Dean of the School of Social Work.

A two-year program leading to the master's degree and authorizations in (1) Child Welfare and Attendance, (2) Psychometry, (3) Psychology, or (4) School Social Work is offered. Consult the Department of Advanced Studies for further information.

SPECIALIZED PREPARATION TO TEACH EXCEPTIONAL CHILDREN

SPECIALIZED PREPARATION WHICH MAY BE SUBSTITUTED FOR A MINOR

Specialized preparation to teach exceptional children may be substituted for a minor in each of the programs leading to the Standard Teaching Credential with Specializations in Elementary Teaching and Secondary Teaching. Specialized preparation is offered in the areas of mental retardation, speech and hearing handicapped, and deaf and hard of hearing. Students wishing to minor in special education should consult the Coordinator of Special Education not later than the second semester of the sophomore year. Students selecting specialized preparation for a minor must select a major in an academic subject matter area.

AREA OF MENTALLY RETARDED

The course work for the credential to teach in the area of the mentally retarded includes the following 22–24 semester units and 4–8 units in student teaching:

	Units
A S 160, 218 or 230, 246, 166 or 251, 162, 253, 161 or 254, 256	22–24
A S 163A	4–8
	26–32

AREA OF SPEECH AND HEARING HANDICAPPED

The course work for specialized preparation in the area of speech and hearing handicapped includes the following clinical practice and student teaching:

For additional information consult the *Communicative Disorders Department.*

	Units
C D 100, 101, 102, 104, 105, 106, 110, 131, 132, 205, 209, 210, 215	39
Psych 119, A S 160, 218, or 230	9
Clinical requirements: C D 130 (2–4 units), 230 (2–6 units), A S 164A (4–9 units)	10
Elect from: C D 103, 111, 113, 121, 133, 188T, 206, 207, 210, 211, 213, 214, 215, 232, other C D courses: A S 168, 245	6
	64

RESTRICTED CREDENTIALS

TEACHER OF EDUCABLE MENTALLY RETARDED CHILDREN

The restricted credential authorizing service as a teacher of educable mentally retarded children is available upon completion of the baccalaureate degree and the following course requirements (consult the Coordinator of Special Education for general provisions):

	Units
A S 160, 218 or 230, 243, 246, E Ed 105	15
A S 166 or 251, 162, 253, 256	12
Elect from: A S 154, 242, 243, 244, 245, C D 128A, B, C; Psych 167, 168	3–6
	30–33
A S 163A	4–8
	34–41

SPEECH AND HEARING SPECIALIST

	Units
C D 100, 101, 102, 104, 105, 106, 110, 128A (2 units), 128B (1 unit), 128C (1 unit), 131, 132, 205, 209, 210, 215	43
Psych 119, A S 153, 160, 218 or 230	12
Clinical requirements: C D 130 (2–4 units), 230 (2–6 units), A S 164A (4–9)	10
Elect from: C D 103, 111, 113, 121, 133, 188T, 206, 207, 210, 211, 213, 214, 215, 232, other C D courses, A S 245	13
	78

Note: The above credential includes communicative disorders baccalaureate requirements.

TEACHER OF DEAF AND SEVERELY HARD OF HEARING CHILDREN

The following course work, clinical practice, and student teaching are offered for students interested in teaching in the area of the Deaf and Severely Hard of Hearing.

	Units
A S 160, 218 or 230, Psych 119	9
C D 100, 104, 131, 132, 136, 137, 162, 164, 235, 262, 263, 264	31
Professional requirements: A S 164B (3 units), C D 268 (6 units)	9
	49

MASTER OF ARTS DEGREE

The Advanced Studies Department offers a master of arts degree in education with concentrations in administration and supervision and educational theory; a master of arts degree in counseling, and a master of arts degree in special education with concentrations in mental retardation, gifted, and educationally handicapped and learning disabilities. Courses may be applied both on these degree programs and on the desired advanced credential program.

For specific requirements for the master of arts degree consult the department chairman and the coordinator of the School of Education graduate program; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies. Students must also comply with policies and procedures established by the School of Education Graduate Committee.

COURSES

ADVANCED STUDIES (A S)

Note: Courses are offered in the following areas:

Educational Foundations: A S 153, 154, 281, 282, 284, 285, 286, 287

Counseling and Guidance: A S 172, 174, 218, 222, 223, 224, 224F, 225, 226, 227, 228, 229, 230, 231, 255

School Administration and Supervision: A S 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 275

Special Education: A S 115F, 160, 161, 162, 163A, 163B, 163C, 164A, 164B, 165, 166, 168, 170, 242, 243, 244, 245, 246, 250, 251, 252, 253, 254, 256D, 257, 258, 259, 260

All areas: A S 190, 220, 280, 290, 298, 299

112. School Public Relations (3) (See Jour 112)

115F. Field Work With Exceptional Children (1–3; max total 6)

Prerequisite: permission of instructor. Supervised observation and participation in selected programs for exceptional children; educational planning, guidance, and counseling.

143. Producing the Educational Broadcast (3) (See R-TV 143)

153. Elementary Statistics (3)
Not open to students with credit in Psych 25. Methods of collecting, organizing, interpreting, and applying data in quantitative studies.

154. Measurement in Education (3)
Objective measurement of capacities and achievement of pupils; construction of informal, objective examinations and criteria for selection of standardized measuring instruments; planning and administering a measurement program.

160. Education of Exceptional Children (3)
Historical development, status and trends in the education and guidance of exceptional children; legal provisions; certification requirements. (2 lecture, 2 lab hours).

161. Training of the Severely Retarded Child (3)
Prerequisite: A S 160. Sensory development and training, growth and developmental processes of the severely mentally retarded child; techniques of working with parents. Observation and participation. (2 lecture, 2 lab hours)

162. Curriculum for the Educable Mentally Retarded and Slow Learner (3)
Methods of instructing the educable mentally retarded child and slow learner; examination and demonstration of materials. (2 lecture, 2 lab hours)

163A. Student Teaching, Exceptional Children: Mentally Retarded (1–8)
Prerequisite: concurrent enrollment for a teaching credential; approval by a departmental review committee. Directed observation, participation and teaching in classes for the mentally retarded in public schools under supervision. Weekly conference with college supervisor.

163B. Student Teaching, Exceptional Children: Educationally Handicapped (1–8)
Prerequisite: concurrent enrollment for a teaching credential; approval by a departmental review committee. Directed observation, participation and teaching in classes for the educationally handicapped in public schools under supervision. Weekly conference with college supervisor.

163C. Student Teaching, Exceptional Children: Gifted (1–8; max total 8)
Prerequisite: concurrent enrollment for a teaching credential; approval by a departmental review committee. Directed observation and teaching in classes for the gifted and creative in public schools under supervision. Weekly conference with college supervisor.

164A. Student Teaching: Speech and Hearing Handicapped (4–9; max total 9)
Prerequisite: 4–6 units of C D 130 or 230, including 150 clock hours of therapy; admission to the credential program. To be taken concurrently with C D 209. Directed observation, participation, and clinical practice (120 hours minimum) under supervision. Weekly conference with college supervisor.

164B. Student Teaching: Deaf and Hard of Hearing (3)
Prerequisite: 4 units of C D 130 or 230; completion of 90 clock hours of clinical practice in the public schools, one semester residence; admission to credential program. Directed observation; participation and clinical practice, under supervision. Weekly conference with college supervisor.

165. Methods in Special Education (1–4; max total 4)
Prerequisite: permission of instructor. Materials and methods for teaching the learning deviates commonly found in regular classrooms, especially the rapid and slow learners; case studies. (2 lecture, 2 lab hours)

166. Cultural and Organic Basis of Mental Retardation (3)
Prerequisite: admission to special education program or permission of instructor. Organic and cultural factors affecting mental retardation; recent research and its impact on present and future classroom practice. (2 lecture, 2 lab hours)

168. Language and Speech Development of Exceptional Children (3)
Prerequisite: A S 160 or permission of instructor. Development of language and speech patterns and disorders for teachers of exceptional children; cultural and ethnic background problems, (bilingualism and alalia), investigations in communication processes; acquisition of language habits. (2 lecture, 2 lab hours)

170. Introduction to Learning Disabilities (3)
Prerequisite: A S 160. Introduction to theories, programs, and methods of educating children with specific learning disabilities. (2 lecture, 2 lab hours)

172. Laws Relating to Children (3) (Former A Ed 221)
Current and proposed legislation in parent-child relationships, adoption, and guardianship, education of the minor, marriage contract, child labor, juvenile delinquency, and child welfare programs.

174. Principles and Techniques in Guidance (3) (Same as Psych 174)
Recommended for both elementary and secondary credential candidates. Prerequisite to all courses in the pupil personnel services credential sequence. Principles, procedures, and techniques in guidance; interrelationships and responsibilities of school personnel; identifying and meeting student needs. (2 lecture, 2 lab hours)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (A S)

(See Course Numbering System—Definitions and Eligibility)

218. Mental Hygiene and Guidance of Children (3) (Same as Psych 218)
Seminar on emotional and social problems of children in their adjustments to school and home practices and pressures. (2 lecture, 2 lab hours)

220. Research in Education (3) (Same as E Ed-S Ed)
Prerequisite: graduate standing and 15 units of education including A S 153 or equivalent. Seminar in research methodology; identification of educational research problems; use of library resources, data gathering and processing, writing a research report.

222. Occupational Analysis and Information (3) (Former A Ed 175)
Prerequisite: A S 174. Theories of vocational development; measurement of occupational status, trends, outlook, and mobility; problems in vocational counseling; research problem acceptable to the instructor required. (2 lecture, 2 lab hours)

223. Child Welfare, Parent Education, and Counseling (3) (Former A Ed 176)
Prerequisite: A S 174. Application of theories and research in child welfare, parent education, and counseling; problems of home, school and child welfare. Research paper required in a selected area.

224. Counseling Techniques (3) (See Psych 224)

224F. Field Work in Counseling (2–12) (See Psych 224F)

225. Advanced Theories and Techniques in Counseling (3)
Prerequisite: A S 222, 224. Advanced study of theories and techniques in counseling; emphasis on application to problems of childhood and adolescence. Case study, interviewing, critique.

226. Organization and Administration of Guidance Services (3)
Prerequisite: completion of 10 or more units in pupil personnel services credential sequence or in master of arts degree program with a concentration in guidance, including A S 222, 224. Organization, administration, and evaluation of guidance services.

227. Tests in Counseling (3) (Former A Ed 177)
Prerequisite: A S 153, 222. Evaluation and selection of psychological tests for guidance and counseling; use of psychometric data in counseling; preparation of case studies. (2 lecture, 2 lab hours)

228. Group Process in Pupil Personnel Services (3) (Former A Ed 179)
Prerequisite: A S 174, 222. Theories and techniques in the group process; application to school guidance procedures. (2 lecture, 2 lab hours)

229. Counseling in the Elementary School (3)
Prerequisite: A S 174, 224. Counseling theory and practice as they apply to the elementary school counselor. Research paper required in a selected area. (2 lecture, 2 lab hours)

230. Guidance of Exceptional Children and Their Parents (3)
Principles and procedures in developing counseling and guidance programs; interrelationship of home and school. Case-study approach to special problems of groups, problems faced by parents of exceptional children, conduct of parent groups, pertinent legislation. Research paper required. (2 lecture, 2 lab hours)

231. Counseling Practicum (3)
Prerequisite: A S 174, 222, 224, 227, 228. Supervised on-campus counseling experiences with school-aged students. Experience in individual counseling, critiquing of tapes and typescripts, case report writing, consulting with teachers and parents. (6 lab hours)

242. Seminar in Behavior Modification (3) (Former A Ed 248.1)
Behavior modification principles, programs, and techniques employed in special education and clinical-prescriptive teaching. Emphasis on school and home applications. (2 discussion, 2 lab hours)

243. Motor, Sensory, and Perceptual Abilities (3) (Former A Ed 248.2)
Prerequisite: A S 160, 170, 245, or permission of instructor. Seminar in the special education of children who are educationally handicapped with psychomotor disabilities. Diagnostic-prescriptive programming and critiques required. (2 lecture, 2 lab hours)

244. Organization and Supervision of Special Education (3)
Seminar in the organization, financing, housing, equipping, staffing, and supervision of the special education program; desirable educational provisions for each type of exceptionality; legal provisions for special education including curriculum development, in-service education, and teacher-pupil relationships.

245. Seminar: Identification and Evaluation of Exceptional Children (3)
Prerequisite: A S 153, 154, 160, or permission of instructor. Review of testing techniques, evaluation of psychological reports, development of psychoeducational recommendations as a clinical process. Independent child study; field testing with appropriate diagnostic instruments. (2 lecture, 2 lab hours)

246. Language and Cognitive Abilities (3) (Former A Ed 248.3)
Prerequisite: A S 160, 170, 243, 245, or permission of instructor. Seminar in the special education of children who are educationally handicapped with language and cognitive disabilities. Diagnostic-prescriptive programming and critiques required. (2 lecture, 2 lab hours)

248. Social and Affective Education (3)
Seminar. Development and remediation of social skills and affective abilities. Model programs for normal children and prescriptive interventions for those with social and personal behavior disorders. (2 lecture, 2 lab hours)

250. Seminar in Prescriptive and Individualized Instruction (3)
Prerequisite: A S 160 or permission of instructor. Development and examination of methods and materials relative to individual learning problems; study of models of individual programs. (2 lecture, 2 lab hours)

251. Seminar in the Mentally Retarded (3) (Former A Ed 247.1)
Prerequisite: A S 160 or permission of instructor. Characteristics and identification procedures, principles of counseling, administrative, and legal provisions for mentally retarded. (Seminar and arranged faculty-supervised clinical practice) (2 lecture, 2 lab hours)

252. Advanced Curriculum and Methods for M R: Preschool and Elementary (3) (Former A Ed 247.2)
Prerequisite: A S 160 or permission of instructor. Examination and application of child growth and development principles through curriculum methods and materials. (Seminar and arranged faculty-supervised clinical practice) (2 lecture, 2 lab hours)

253. Vocational/Career Education for the Handicapped (3) (Former A Ed 247.3)
Seminar. Prerequisite: A S 160, 162 or permission of instructor. Concurrent enrollment in A S 256 recommended. Examination and application of vocational/career education and training for the handicapped; local, state and federal models. (2 lecture, 2 lab hours)

254. Seminar in the Trainable Child (3) (Former A Ed 247.4)
Prerequisite: A S 160 or permission of instructor. Characteristics, identification procedures, training programs, legal, and administrative problems. Research in causation, prevention, and treatment of severe retardation. Counseling of parents.

255. Individual Mental Testing (3) (See Psych 265)

256. Practicum in Special Education (3–9; max total 9)
Prerequisite: A S 160, 170, 243, 245, 246 or permission of instructor. Clinical experience in diagnosis and evaluation of exceptional children, prescriptive program development, prescriptive instruction, and program management. Experience to include data gathering, program planning and execution, evaluation and consultation. (6 field hours arranged)

256D. Practicum and Clinical Experience: Gifted (3-9; max total 9) (Former A Ed 256.4)
Prerequisite: A S 160 or permission of instructor. Clinical experience in community agencies dealing with the identification, diagnosis, and education of mentally gifted children. Practical field experience in cooperating school districts with special and experimental programs. (6 field hours arranged)

257. Seminar on the Gifted Child (3) (Former A Ed 249.1)
Prerequisite: A S 160 or permission of instructor. Research and practice regarding community attitudes, means of identification, types of giftedness, behavioral characteristics, environmental backgrounds, differentiated needs of the gifted.

258. Seminar in Educational Provisions for the Gifted (3) (Former A Ed 249.2)
Prerequisite: A S 160 or permission of instructor. Research pertaining to administrative provisions, program planning, curricular adaptations, teaching-learning strategies, and ways of motivating gifted and talented youth.

259. Seminar in Creative Children and Youth (3) (Former A Ed 249.3)
Prerequisite: A S 160 or permission of instructor. Analysis of current theory and research on creativity, its manifestations and measurement; guidelines for creative development, creative approaches in learning and teaching.

260. Seminar in Research in Contemporary Problems: Gifted and Creative (3) (Former A Ed 249.4)
Prerequisite: A S 160 or permission of instructor. Analysis of research problems regarding the gifted, creative, and talented. Individual critiques or original research. Development of research project in preparation for the thesis.

261. Organization for Administration and Support of Education (3)
Prerequisite: teaching experience. Interrelationships of federal, state, county, city, and district units in the administration and promotion of programs of education.

262. Seminar in School Principalship (3)
Prerequisite: teaching experience; A S 261 or equivalent. Seminar on problems, procedures, and organizational relationships of elementary and secondary schools; principal's responsibilities in areas of organization and control; teacher personnel, pupil personnel, noncertificated personnel; special and auxiliary agencies; guidance; supervision; community relationships.

263. Seminar in Supervision for Improvement of Instruction (3)
Prerequisite: teaching experience; E Ed 250 or S Ed 253; A S 261; or equivalent. Seminar for clarification and application of modern concepts and techniques of supervision; practice in leadership roles, promoting productive human relationships, developing communication skills, and evaluation of teaching; ways of helping teachers in their credential fields.

264. Seminar in the Legal Aspects of Education (3)
Prerequisite: teaching experience; A S 261 or equivalent. A case study approach in reviewing important court decisions, both state and federal, that have directly affected the public schools. Legal relationships in public education applied to federal, state, and local levels.

265. Seminar in Legal and Financial Principles in School Administration (3)
Prerequisite: A S 261, permission of instructor. Fiscal policies controlling the management of the school and the responsibilities and obligations of the school principal in relation to staff, pupils, parents, and public. Legal liability and established defenses; personnel policies; admission and attendance regulations; pupil control measures.

266. Seminar in School Finance and Business Administration (3)
Prerequisite: A S 261 or equivalent. Principles and practices of school finance and business administration; local, state, and federal responsibility for financial support of education.

267. Seminar in School Facilities (3)
Prerequisite: A S 266 or equivalent. Seminar on instructional aspects of school plants and equipment; planning and utilization; citizens committees; school surveys; school-community relations.

268. Field Work in School Administration (1)
For in-service teachers working toward administration and/or supervision credentials. Prerequisite: admission to the credential program, permission of instructor. On-the-job participation in the solution of problems in administration; written report required. A minimum of three meetings on campus during the semester.

269. Field Work in School Supervision (1)
For in-service teachers working toward administration and/or supervision credentials. Prerequisite: admission to the credential program, permission of instructor. On-the-job participation in the solution of problems in supervision; written report required. A minimum of three meetings on campus during the semester.

270. Seminar in School Business Administration I (3)
Prerequisite: A S 266; 12 units of business administration and accounting or permission of instructor. Theoretical and practical treatment of school budget management; accounts, audits and reports, personnel administration, management of service functions including transportation and cafeterias; relationship of business management to the effectiveness of public education.

271. Seminar in School Business Administration II (3)
Prerequisite: A S 270. Theoretical and practical treatment of school capital outlay and debt service administration; protection and financing of capital outlay programs; bonding and management of bonded debt; management of school plant insurance programs; relationship of school plant to effective education.

272. Seminar in Advanced Curriculum Evaluation and Development (3)
Nature and scope of curriculum development: administrative determiners of curriculum; influence of governmental agencies and organizations, foundations, business and industry, and power structures as curriculum determiners; international influence on curriculum development and curriculum evaluation at various levels of governmental operation.

275. Seminar in Advanced Techniques of Personnel Administration in Education (3)
Prerequisite: A S 262, 264, 266, or permission of instructor. Advanced techniques of staff improvement in service, staff participation in policy making, improvement of communication channels and methods of communication, economic and contractual relationships and improvement of working conditions; work and responsibiliy of nonteaching staff members.

280. Seminar in Advanced Problems in Education (3; max total 21)
Prerequisite: teaching experience or permission of instructor. Assessment and evaluation, computer programming, creativity in education, instructional innovations, in-service education, politics in education, advanced statistics.

281. Selected Applications of Statistical Techniques (3)
Prerequisite: A S 153 or equivalent. Application and interpretation of correlation techniques, chi square, the "t" and "F" tests, interval estimation, and the simple case of analysis of variance.

282. Philosophy of Education (3) (Former S Ed 187. See S Ed 282)

284. Seminar in International Education (3)
Analysis of historical, social and political forces which shape national education endeavor. Emerging international education efforts and organizations.

285. Seminar in Advanced Educational Psychology (3)
Prerequisite: E Ed 105 or S Ed 152. Seminar on the psychological foundations of education; nature and characteristics of development, learning process, forces which affect educational growth.

286. Seminar in Advanced Educational Sociology (3)
Prerequisite: S Ed 186 or E Ed 100 or S Ed 151, or course in sociology or anthropology and permission of instructor. Seminar for analysis of effect of institutional and ideological trends and problems on the role and operation of the school in American society.

287. Seminar in History of Educational Thought (3)
Prerequisite: S Ed or A S 282, or philosophy course and permission of instructor. Seminar on historical foundations of educational theory; growth of thought regarding teaching and learning; relationship of educational theory and practice in the United States.

290. Independent Study (1-3; max see reference)
See *General Information—Independent Study.*

298. Directed Research (6)
Prerequisite: advancement to candidacy for MA degree; B average on 24 units of MA program including A S 220 and 6 units on Fresno campus. Research in solution of educational problems; separate sections for administration and supervision, counseling and guidance, educational theory, special education. Individual research papers, and weekly seminar conferences arranged.

299. Thesis (6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

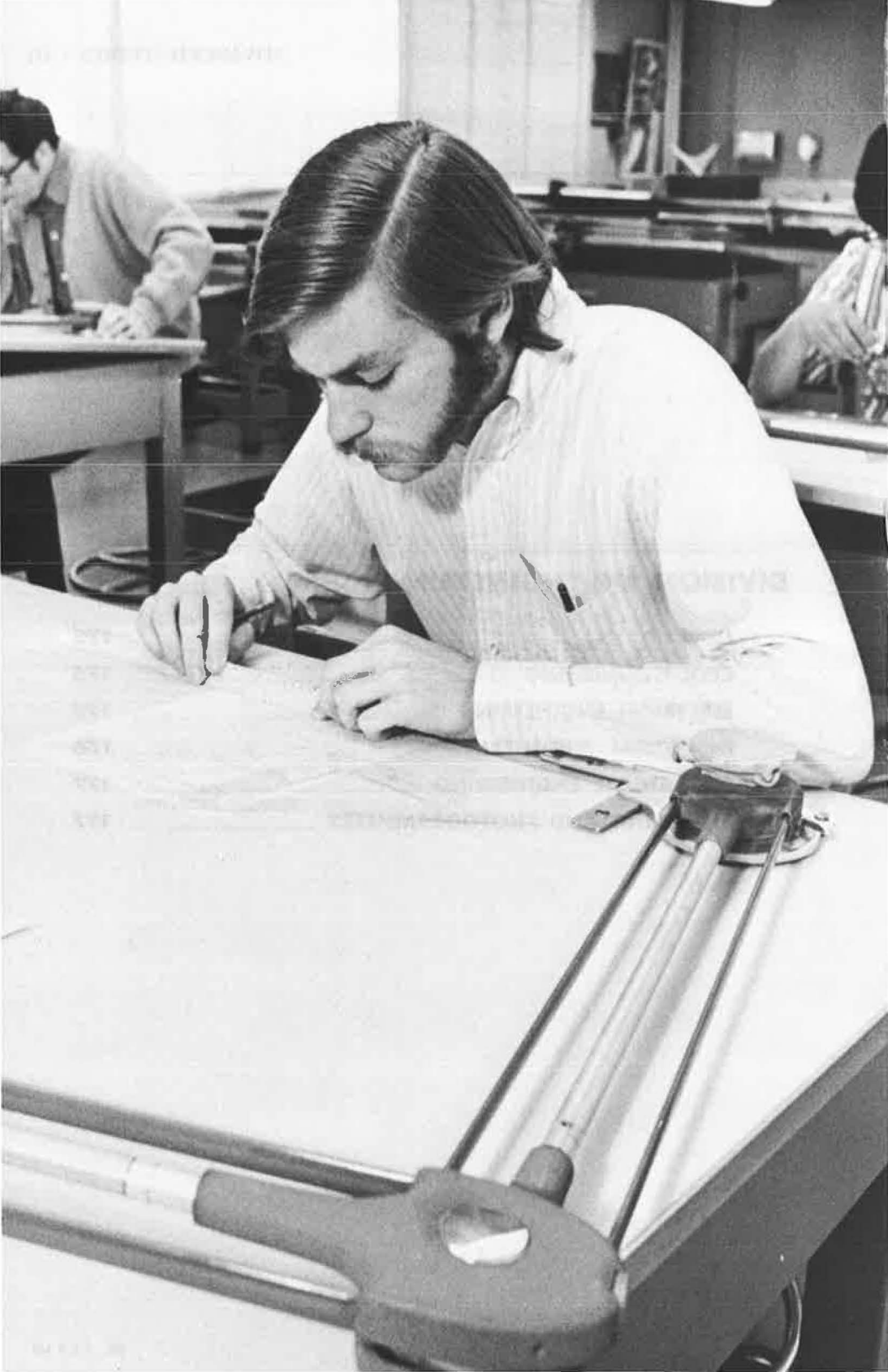
IN-SERVICE COURSES

(See *Course Numbering System.*)

373. Instructional and Curriculum Problems and Practices (1-3; max total 12 if no topic repeated)

DIVISION OF ENGINEERING

GENERAL 173
CIVIL ENGINEERING 175
ELECTRICAL ENGINEERING 175
INDUSTRIAL ENGINEERING 176
MECHANICAL ENGINEERING 177
SURVEYING AND PHOTOGRAMMETRY 177



DIVISION OF ENGINEERING

James H. Smith, Director

Professors: J. H. Smith, Barnhart, Bevill, T. Evans, Foin, Higgins, Jarrett, Kulhan, Richards
Associate Professors: Bodger, Deming, Dominick (Assistant Director), Haynes, Hotz, Liao, Rowland, Supersad
Lecturer: Damm
Part-time: Brechmann, Erickson, Grote, Ho, Lafferty, Ostrander, Poulin, Sarkisian, Serabian

Engineering may be defined as the application of science for the benefit of society. Therefore, the engineering student pursues courses in the sciences, mathematics, humanities, and social sciences; and in engineering science which interfaces the courses in science with those in professional engineering. Because it embraces a broad horizon, engineering is divided into interrelated fields of specialization. The Division provides instruction in the fields of civil, electrical, industrial, and mechanical engineering. Electrical engineering includes the study of electronics. A program in surveying and photogrammetry is also offered. Engineering students are prepared to enter the practice of professional engineering or graduate study; students studying surveying and photogrammetry are prepared to become specialists in the various aspects of surveying.

The civil, electrical, and mechanical engineering programs are accredited by the Engineers' Council for Professional Development (ECPD), the nationally recognized accrediting agency of the engineering profession.

HIGH SCHOOL PREPARATION

Recommended preparation for engineering or surveying and photogrammetry consists of: English (3 years), algebra (2 years), geometry (1 year), trigonometry (½ year), physics or chemistry (1 year). Additional recommended courses are: advanced mathematics (½ year), chemistry or physics (1 year), mechanical drawing (½ year), shop (½ year).

TRANSFERS

Transfers from community colleges or other institutions of higher learning are accepted under provisions outlined under *General Information—Admissions.* Students planning to transfer to the Fresno State engineering or the surveying and photogrammetry programs should follow as closely as possible the outline of the program of their choice.

ENGINEERING FIELDS

Civil Engineering. Civil engineering is concerned with the science and technology of planning, analyzing, designing, constructing, operating, and maintaining structures, transportation systems, environmental works, and water resource developments. Within these fields the civil engineer deals with buildings, bridges, foundations, highways, airports, waterways, pipelines, surveying, mapping, water supply systems, waste treatment systems, environmental water quality control, dams, hydropower installations, irrigation, flood control, and other fixed engineering works.

The civil engineer may utilize computer methods of analyzing and designing complex structures and systems; undertake research on structural use of new materials or on advanced methods of water and waste treatment; design protective structural features and radiation shielding in nuclear power plants; participate in structural and facility aspects of aerospace projects; or work in municipal engineering, urban planning, or vehicular traffic control.

Electrical Engineering. Electrical engineering concerns the production and utilization of electrical energy. The many specialties are grouped under the areas of electronics and power. In each area, the engineer is responsible for the analysis, development, design, and management of equipment and systems.

Electronics engineering specialists are concerned with high-frequency power and its use in equipment and systems pertaining to communications as exemplified by radio, television, telephony, and optical radiation; to computers and information processing, guidance and control; and to electronics combined with other specialized fields such as medical electronics.

Power engineering specialists deal with electrical power and its utilization in lighting,

powering, and heating, and with related equipment. The areas of electronics and power are not independent of each other or of other fields of engineering. The electrical engineering program provides the student with broad, basic training so that upon graduation he may enter any of the areas of electrical engineering.

Industrial Engineering. Industrial engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.

Industrial engineers give valuable service to management in decision making relative to the most efficient utilization of men, materials, equipment, and energy. Industrial engineers are a prime source of management talent and therefore are in demand by a wide variety of organizations, even those not usually regarded as "industrial."

Mechanical Engineering. Mechanical engineering deals with engineering problems relating to the generation, transmission, and utilization of energy in the thermal or mechanical form. It is concerned also with engineering problems related to the production of tools, machinery, and their products and to heating, ventilation, refrigeration, and plumbing in their research, design, production, operation, organization, and economic aspects.

Mechanical engineers are concerned with propulsion systems; cryogenics; environmental systems for control of humidity, temperature, and air cleanliness; transportation equipment including land, water, and space vehicles and mechanical, pneumatic, and hydraulic conveyor systems; power components including engines, turbines, rockets, jets, and fuel cells; and machinery such as pumps, fans, compressors, blowers, valves, and material handling and processing equipment including machine tools and food processing equipment.

SURVEYING AND PHOTOGRAMMETRY

Graduates of this program are prepared as specialists trained in the theory and applied techniques of topographic, geodetic, cadastral (land), and photogrammetric surveying.

BACHELOR OF SCIENCE DEGREE PROGRAMS

The bachelor of science degree is granted upon completion of the following programs: civil, electrical, industrial, or mechanical engineering; surveying and photogrammetry. These programs include the general education and degree requirements of the college. Foreign students taking I S C 10, 21, and 93 in their first year may postpone courses that are not prerequisite to courses in their major.

CIVIL ENGINEERING

(70 units engineering; 132 units total)

FIRST SEMESTER		Units
Engr 26	Engineering Graphics	4
Math 75	Mathematical Analysis I	4
Chem 1A	General Chem & Qualitative Analysis	5
PE	Physical Education	1
		14

SECOND SEMESTER		Units
Engr 70	Computer Programming	2
Math 76	Mathematical Analysis II	4
Chem 8	Elementary Organic Chemistry	3
Phys 4A	Mechanics and Wave Motion	4
Hist 11/12	American History	3
PE	Physical Education	1
		17

THIRD SEMESTER		
C E 1, L	Plane Surveying	3
C E 20	Engineering Mechanics: Statics	3
Math 77	Mathematical Analysis III	4
Phys 4B	Electricity, Magnetism, Heat	4
Pl Si 2	American Govt and Institutions	3
		17

FOURTH SEMESTER		
C E 2, L	Adv Plane Surveying [4]	3
M E 31	Engineering Materials	2
Math 81	Applied Analysis	4
Phys 4C	Light and Modern Physics	4
Geol 1, L	Physical Geology	4
		17

FIFTH SEMESTER		
C E 121, L	Mechanics of Materials	4
C E 150	Transportation Planning & Design	3
M E 112	Engineering Mechanics: Dynamics	3
M E 116, L	Thermodynamics-Fluid Mechanics A	4
Soc Sci	See [3]	3
		17

SIXTH SEMESTER		
C E 123, L	Soil Mechanics	3
C E 130	Theory of Structures	3
C E 142	Water Supply & Wastewater Engineering	3
M E 136	Thermodynamics-Fluid Mechanics B	3
Soc Sci	See [3]	3
PE	Physical Education	1
		16

SEVENTH SEMESTER		
C E 124	Concrete Laboratory	1
C E 132	Reinforced Concrete	3
Engr 160	Engineering Economy	2
E E 110, L	Magnetic and Electric Circuits	4
App Elect	See [1]	6
PE	Physical Education	1
		17

EIGHTH SEMESTER		
C E 133	Steel and Timber Structures	3
C E 180	Senior Project	1
Engr 182	Engineering Writing	1
App Elect	See [1]	6
Humanities	See [2]	6
		17

[1] **Approved Electives:** Select from courses in one or more of the following groups; selection of asterisked courses requires the Director's prior approval.
Construction: C E 101, 152; Engr 161; I A 110 *.
Environmental Water Quality: C E 140, 144; Biol 133 *, Mcrb 20 *.
Structures: C E 122, 131, 134, 135.
Surveying: C E 3, 101, 102, 104, 105.
Transportation: C E 101, 140, 151, 152, 153.
Water Resources: C E 140, 141, 143, 144; I E 110.
Additional approved electives: C E 190, 191T; Engr 173.

[2] **Humanities:** Select from Art 5, 6, 60; Drama 62, 184; Engl 20; Hist 1, 110, 111, 112; Phil 20T.

[3] **Social Sciences:** Select from Anth 2, 3; Econ 1A, 1B, 15; Hist 3, 6, 7, 8; Soc 1, 2, 130.

[4] **Environmental Water Quality Students:** With the Director's approval, substitute Bot 10 for C E 2, L.

ELECTRICAL ENGINEERING

(68 units engineering; 136 units total)

FIRST SEMESTER		Units
Math 75	Mathematical Analysis I	4
Hist 11/12	American History	3
Pl Si 2	American Govt and Institutions	3
Econ 1A	Principles of Economics [3]	3
Engl 1	Composition	3
PE	Physical Education	1
		17

SECOND SEMESTER		Units
Math 76	Mathematical Analysis II	4
Chem 1A	General Chem & Qualitative Analysis	5
Phys 4A	Mechanics and Wave Motion	4
Econ 1B	Principles of Economics [3]	3
PE	Physical Education	1
		17

THIRD SEMESTER		
Engr 70	Computer Programming	2
C E 20	Engineering Mechanics: Statics	3
Math 77	Mathematics Analysis III	4
Phys 4B	Electricity, Magnetism, Heat	4
Chem 8	Elementary Organic Chemistry	3
PE	Physical Education	1
		17

FOURTH SEMESTER		
M E 31	Engineering Materials	2
Engl 20	Literature and Composition	4
Math 81	Applied Analysis	4
Phys 4C	Light and Modern Physics	4
Humanities	See [2]	3
		17

FIFTH SEMESTER		
EE 110, L	Magnetic and Electric Circuits	4
EE 126	Electromagnetic Fields and Waves	3
EE 128, L	Electronic Devices and Circuits	4
ME 112	Engineering Mechanics: Dynamics	3
Phys 102	Modern Physics	3
		17

SIXTH SEMESTER		
EE 121, L	Electrical Machinery	4
EE 124, L	Electrical Circuit Analysis	4
EE 140, L	Pulse and Digital Circuits	4
EE 189A	Developments in Engineering	1
CE 121	Mechanics of Materials	3
PE	Physical Education	1
		17

SEVENTH SEMESTER		
E E 134	Information Transmission	3
E E 136, L	Electromagnetic Energy Transmission	4
Engr 160	Engineering Economy	2
M E 116, L	Thermodynamics-Fluid Mechanics A	4
App Elect	See [1]	4
		17

EIGHTH SEMESTER		
E E 180	Senior Project	1
E E 189B	Developments in Engineering	1
Engr 182	Engineering Writing	1
M E 136	Thermodynamics-Fluid Mechanics B	3
App Elect	See [1]	8
Gen Elect	See [4]	3
		17

[1] **Approved Electives:** Select from the following courses, with at least 6 units from the boldfaced course numbers:
Computer Sciences and Engineering: **E E 176;** Engr 173, 174.
Control Systems: **E E 155, 155L.**
Electrical Power Systems Analysis: **E E 151, 151L.**
Electromagnetic Measurements Laboratory: E E 169.
Legal Aspects of Engineering: Engr 161.
* Mathematics: Math 107, 123, 174, 181, 182.
Microwave Devices and Circuits: **E E 166, 166L.**
Network Synthesis: **E E 161.**
Quantum Electronics: **E E 171.**
* Solid State Physics: Phys 162.
Statistical Analysis and Control: I E 110, 112, 112L.
* A minor in Mathematics or Physics may be earned by a minimal number of additional units.

[2] **Humanities:** Select from Art 5, 6, 60; Drama 62, 184; Hist 1, 110, 111, 112; Phil 20T.

[3] **Social Sciences:** Or, with adviser's permission, select from Anth 2, 3; Econ 15; Hist 3, 6, 7, 8; Soc 1, 2, 130.

[4] **General Electives:** May be selected from approved electives.

INDUSTRIAL ENGINEERING

(61 units engineering; 132 units total)

FIRST SEMESTER		*Units*
Engr 26	Engineering Graphics	4
Math 75	Mathematical Analysis I	4
Chem 1A	General Chem & Qualitative Analysis	5
Hist 11/12	American History	3
PE	Physical Education	1
		17

SECOND SEMESTER		*Units*
Engr 70	Computer Programming	2
Math 76	Mathematical Analysis II	4
Chem 8	Elementary Organic Chemistry	3
Phys 4A	Mechanics and Wave Motion	4
Pl Si 2	American Govt and Institutions	3
PE	Physical Education	1
		17

THIRD SEMESTER		
C E 20	Engineering Mechanics: Statics	3
M E 31	Engineering Materials	2
Math 77	Mathematical analysis III	4
Phys 4B	Electricity, Magnetism, Heat	4
Econ 1A	Principles of Economics	3
PE	Physical Education	1
		17

FOURTH SEMESTER		
M E 11, L	Manufacturing Processes	3
Econ 1B	Principles of Economics	3
Math 81	Applied Analysis	4
Phys 4C	Light and Modern Physics	4
PE	Physical Education	1
		15

FIFTH SEMESTER		
E E 110, L	Magnetic and Electric Circuits	4
M E 112	Engineering Mechanics: Dynamics	3
M E 116, L	Thermodynamics-Fluid Mechanics A	4
Acct 4A	Fin & Managerial Acct Prin & Systems	3
Humanities	See [2]	3
		17

SIXTH SEMESTER		
I E 110	Statistical Analysis and Control	3
I E 111	Methods Analysis	2
C E 121, L	Mechanics of Materials	4
M E 136, L	Thermodynamics-Fluid Mechanics B	4
Acct 4B	Fin & Managerial Acct Prin & Systems	3
		16

SEVENTH SEMESTER		
I E 112, L	Statistical Design of Experiments	4
Engr 160	Engineering Economy	2
E E 121, L	Electrical Machinery	
or, E E 128	Electronic Devices & Circuits	4/3
App Elect	See [1]	3/4
Gen Elect	See [4]	3
		16

EIGHTH SEMESTER		
I E 113	Operations Analysis	3
I E 114	Facilities Engineering	2
I E 180	Senior Project	1
Engr 182	Engineering Writing	1
App Elect	See [1]	3
Humanities	See [2]	3
Nat/Soc Sci	See [3]	4
		17

[1] **Approved Electives:** Select from I E 190, 191T; Engr 161, 173; C E 122; M E 134, 154; Mgt 110A-B; Math 107.

[2] **Humanities:** Select from Art 5, 6, 60; Drama 62, 184; Engl 20, 44, 50T; Hist 1, 110, 111, 112, 121, 131, 132; Phil 20T.

[3] **Natural or Social Science:** Select from Psych 10, 60T, 145, 160T.

[4] **General Electives:** May be selected from approved electives.

MECHANICAL ENGINEERING

(66 units engineering; 128 units total)

FIRST SEMESTER		Units
Engr 26	Engineering Graphics	4
Math 75	Mathematical Analysis I	4
Chem 1A	General Chem & Qualitative Analysis	5
PE	Physical Education	1
		14

SECOND SEMESTER		Units
Engr 70	Computer Programming	2
Math 76	Mathematical Analysis II	4
Chem 8	Elementary Organic Chemistry	3
Phys 4A	Mechanics and Wave Motion	4
Humanities	See [2]	3
PE	Physical Education	1
		17

THIRD SEMESTER		
C E 20	Engineering Mechanics: Statics	3
Hist 11/12	American History	3
Math 77	Mathematical Analysis III	4
Phys 4B	Electricity, Magnetism, Heat	4
Soc Sci	See [2]	3
		17

FOURTH SEMESTER		
M E 11, L	Manufacturing Processes	3
M E 31	Engineering Materials	2
Math 81	Applied Analysis	4
Phys 4C	Light and Modern Physics	4
Pl Si 2	American Govt and Institutions	3
PE	Physical Education	1
		17

FIFTH SEMESTER		
M E 112	Engineering Mechanics: Dynamics	3
M E 116	Thermodynamics-Fluid Mechanics A	3
M E 117	Instrumentation & Fluid Laboratory	2
C E 121	Mechanics of Materials	3
Soc Sci	See [3]	3
PE	Physical Education	1
		15

SIXTH SEMESTER		
M E 131	Advanced Engineering Materials	3
M E 134	Mechanism	3
M E 136, L	Thermodynamics-Fluid Mechanics B	4
E E 110, L	Magnetic and Electric Circuits	4
App Elect	See [1]	3
		17

SEVENTH SEMESTER		
M E 154	Machine Design	3
M E 156, L	Adv Thermodynamics-Fluid Mechanics	4
E E 121, L	Electrical Machinery	4
App Elect	See [1]	6
		17

EIGHTH SEMESTER		
M E 180	Senior Project	1
Engr 160	Engineering Economy	2
Engr 182	Engineering Writing	1
App Elect	See [1]	3
Humanities	See [2]	3
Hum/Soc Sci	See [2], [3]	4
		14

[1] **Approved Electives:** Select at least one course from each of the following groups: **Group 1:** M E 137, 146, 146L; **Group 2:** M E 142, 144, 164; **Group 3:** M E 143, 151; Engr 173.

[2] **Humanities:** Select from Art 5, 6, 60; Drama 62, 184; Engl 20; Hist 1, 110, 111, 112; Phil 20T.

[3] **Social Sciences:** Select from Anth 2, 3; Econ 1A, 1B,15; Hist 3, 6, 7, 8; Soc 1, 2, 130.

SURVEYING AND PHOTOGRAMMETRY

(53 units engineering; 124 units total)

FIRST SEMESTER		Units
Engr 26	Engineering Graphics	4
Math 75	Mathematical Analysis I	4
Chem 2A	Introductory General Chemistry	3
Engl 1	Composition	3
PE	Physical Education	1
		15

SECOND SEMESTER		Units
Phys 2A	General Physics	4
Math 76	Mathematical Analysis II	4
Chem 2B	Introductory General Chemistry	3
Hist 11/12	American History	3
PE	Physical Education	1
		15

THIRD SEMESTER		
C E 1, L	Plane Surveying	3
C E 3	Photogrammetry	2
App Elect	See [1]	2
Phys 2B	General Physics	4
Spch 3	Fundamentals of Oral Communication	3
PE	Physical Education	1
		15

FOURTH SEMESTER		
C E 2, L	Advanced Plane Surveying	3
C E 4	Machine Comp & Computer Programming	3
Geol 1, L	Physical Geology	4
Jour 17	Introductory & Publications Photog	3
Soc Sci	Geog 4 World Geography recommended	3
		16

FIFTH SEMESTER		
C E 102, L	Geodetic Surveying	3
C E 104	Boundary Control & Legal Principles	2
E E 104	Basic Electronics	3
App Elect	See [1]	3
Geog 112	Aerial Photograph Interpretation	3
Gen Elect	See [2]	2
		16

SIXTH SEMESTER		
C E 101, L	Route Surveying	3
C E 103	Advanced Photogrammetry	3
App Elect	See [1]	3
U R P 100	Intro to Urban & Regional Planning	3
Pl Si 2	American Govt and Institutions	3
PE	Physical Education	1
		16

SEVENTH SEMESTER		
C E 105	Advanced Survey Computations	3
C E 107	Electronic Distance Measurements	3
App Elect	See [1]	4
Geog 115	Cartography	3
Humanities	See General Education Requirements	3
		16

EIGHTH SEMESTER		
C E 106	Cartographic Techniques & Map Repro	2
C E 180	Senior Project	1
Engr 161	Legal Aspects of Engineering	2
Engr 182	Engineering Writing	1
Geog 111	Map Interpretation	3
Jour 113	Public Relations	3
Humanities	See General Education Requirements	3
		15

[1] **Approved Electives:** Select from the following courses: C E 20, 120, 120L, 121, 150, 190, 191T; Engr 70, 160; Math 77, 81.
[2] **General Elective:** May be selected from approved electives.

GENERAL EDUCATION REQUIREMENTS

The following course will satisfy general education requirements. *Area IV:* Engr 70. (*See General Education—Courses.*)

COURSES

ENGINEERING (Engr)

26. Engineering Graphics (4)
Prerequisite: Math 75 (or concurrently). Principles and applications of orthographic projection and graphical mathematics to the solution of engineering problems. (2 lecture, 2 3-hour labs)

70. Computer Programming (2)
Prerequisite: Math 75 (or concurrently). Introduction to digital computer programming. (1 lecture, 3 lab hours)

100. Technology and Society (3)
Prerequisite: junior standing. Technological developments and their effects on society; ecology and environment; selected examples.

115. Home Applications of Engineering (2)
Prerequisite: junior standing or permission of instructor. Management of household and yard appliances, underlying principles of their operation, installation, and maintenance; lighting for utility and aesthetics; safety. (2 lecture-demonstration hours)

160. Engineering Economy (2) (Former Engr 170)
Prerequisite: senior standing in engineering or permission of instructor. Importance of economic analyses of problems in engineering and in management decision making; interest, depreciation, income tax, classification of costs, break-even and minimum cost points, economic comparisons of alternatives, economy of replacement.

161. Legal Aspects of Engineering (2) (Former Engr 171)
Prerequisite: senior standing in engineering or permission of instructor. Development of law, canons of ethics, torts, principles of contracts, contracting procedure and specifications, property, negotiable instruments, sales, agency and patents; preparation of reports.

173. Analog Computation (2)
Prerequisite: Phys 4B, Math 77 (or concurrently). Introduction to electronic analog computer programming. (1 lecture, 3 lab hours)

174. Numerical Methods for Engineers (2)
Prerequisite: permission of instructor. Numerical methods for computer evaluation of special functions; computer evaluation of Gamma, Beta, Legendre, and Bessel functions; infinite series, integrals, differential equations, recurrence formulas. (1 lecture, 3 lab hours)

182. Engineering Writing (1)
Corequisite: senior project. Preparation of applications, forms, letters, reports, and specifications. Substance of final report: senior project investigation.

CIVIL ENGINEERING (C E)

1. Plane Surveying (2) (Former Engr 1)
Prerequisite: Math 30. Familiarization with surveying instruments; calculations; topographic surveying.

1L. Plane Surveying Laboratory (1) (Former Engr 1L)
Prerequisite: C E 1 (or concurrently). Field practice in measurements of distance and use of level, transit, and plane table in solution of practical problems. (3 lab hours; field trips required)

2. Advanced Plane Surveying (2) (Former Engr 2)
Prerequisite: C E 1L. Theory and computations covering land surveying; engineering astronomy; introduction to route surveying.

2L. Advanced Plane Surveying Laboratory (1) (Former Engr 2L)
Prerequisite: C E 2 (or concurrently). Field practice in land surveying, astronomy, triangulation, and route layout. (3 lab hours; field trips required)

3. Fundamentals of Metrical Photogrammetry (2) (Former Engr 3)
Prerequisite: C E 1 or permission of instructor. Fundamental characteristics of metrical photography and photogrammetric equipment: extraction of metrical data from single and overlapping photographs; flight planning and control considerations for photogrammetric mapping; accuracy and economy. (1 lecture, 3 lab hours)

4. Machine Computing and Computer Programming (3) (Former Engr 4)
Prerequisite: C E 2L or permission of instructor. Survey computations by use of desk calculator; electronic computer programming. (2 lecture, 3 lab hours)

20. Engineering Mechanics: Statics (3) (Former Engr 30)
Prerequisite: Phys 4A, Math 77 (or concurrently), or permission of instructor. Analysis of force systems, equilibrium problems, section properties; graphic, algebraic, and vector methods of problem solution. (2 lecture, 2 lab hours)

101. Route Surveying (2) (Former Engr 101)
Prerequisite: C E 2L. Computation and field work covering surveys for highway, irrigation, construction, and other kinds of engineering projects. (1 lecture, 3 lab hours; field trips required)

101L. Route Surveying Laboratory (1) (Former Engr 101L)
Prerequisite: C E 101 (or concurrently). Survey for highway location, stakeout of roads and intersections from plans. (3 lab hours)

102. Geodetic Surveying (2) (Former Engr 102)
Prerequisite: C E 2L, Math 76. Triangulation: adjustment of geodetic figures; base line measurement; map projection; precise leveling. (1 lecture, 3 lab hours; field trips required)

102L. Geodetic Surveying Laboratory (1) (Former Engr 102L)
Prerequisite: C E 102 (or concurrently). Field work for surveying and photogrammetry majors. (3 lab hours)

103. Advanced Photogrammetry (3) (Former Engr 109)
Prerequisite: C E 3 or permission of instructor. Theory of stereo-orientation, compilation error propagation, and aerial triangulation; introduction to analytical photogrammetry. (1 lecture, 2 3-hour labs)

104. Boundary Control and Legal Principles (2) (Former Engr 104)
Prerequisite: C E 2. Legal principles that control the boundary location of real property.

105. Advanced Survey Computations (3) (Former Engr 105)
Prerequisite: C E 4 or Engr 70, C E 102. Computation and adjustment of problems encountered in previous surveying courses by simple adjustment and method of least squares and with programming for electronic computers. (2 lecture, 3 lab hours)

106. Cartographic Techniques and Map Reproduction (2) (Former Engr 106)
Prerequisite: C E 3, Chem 2B. Cartographic color separation, scribing; line and half-tone copy, theory of photographic processes, photographic optics, emulsions, developers, lenses; offset lithographic process, single- and multicolor photolithographic reproduction; modern edge enhancement and photo-tone techniques. (1 lecture, 3 lab hours)

107. Electronic Distance Measurements (3) (Former Engr 107)
Prerequisite: C E 102, E E 104, or permission of instructor. Introduction to electronic surveying systems. Analysis of main elements in electronic surveying instruments; geometrical concepts in electronic measurements. Use of electronic distance measurements in surveying, traverse, and trilateration. Use of airborne systems. (2 lecture, 3 lab hours; field trips required)

120. Strength of Construction Materials (3) (Former Engr 132)
Not open to civil engineering majors. Prerequisite: Phys 2A. Stress and deflections in steel and wood structures and in formwork for concrete structures.

120L. Strength of Construction Materials Laboratory (1) (Former Engr 132L)
Prerequisite: C E 120 (or concurrently). Application of testing procedures to determine and verify limitations on the use of construction materials. (3 lab hours)

121. Mechanics of Materials (3) (Former Engr 131)
Prerequisite: C E 20. Application of principles of mechanics to find stresses and deformations in machine and structural members.

121L. Mechanics of Materials Laboratory (1) (Former Engr 131L)
Prerequisite: C E 121 (or concurrently), M E 31. Application of the principles and methods of testing to verify theory and determine limitations of principles of mechanics of materials. (3 lab hours)

122. Advanced Mechanics of Materials (3) (Former Engr 139)
Prerequisite: C E 121, Engr 70, Math 81. Advanced topics in mechanics of materials.

123. Soil Mechanics (2) (Former Engr 137)
Prerequisite: C E 121. Physical and mechanical properties of soil as an engineering material; theoretical studies in permeability, compressibility, stress-deformation, and strength characteristics.

123L. Soil Mechanics Laboratory (1) (Former Engr 137L)
Prerequisite: C E 121L, 123 (or concurrently). Experiments to illustrate and amplify the principles of soil mechanics. (3 lab hours; field trips required)

124. Concrete Laboratory (1) (Former Engr 143)
Prerequisite: C E 121L. Proportioning of concrete mixes; admixtures; workability tests; compressive, flexural, and tensile strength tests; reinforced concrete. (3 lab hours; field trips required)

130. Theory of Structures (3) (Former Engr 135)
Prerequisite: C E 121. Trusses and frames analyzed by algebraic and graphic procedures; influence lines and live loading analysis; rigid frames analyzed by slope deflection and moment distribution. Introduction to matrix methods.

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131. Intermediate Theory of Structures (3) (Former Engr 146)
Prerequisite: C E 130. Analysis of statically indeterminate beams, trusses, and frames; energy methods; column analogy; advanced topics in slope deflection and moment distribution; matrix methods.

132. Reinforced Concrete (3) (Former Engr 134)
Prerequisite: C E 130. Design and investigation of concrete structures by elastic and ultimate design procedures; prestressed concrete.

133. Steel and Timber Structures (3) (Former Engr 133)
Prerequisite: C E 130. Steel and timber members for buildings and bridges designed for dead, live, impact, wind, and seismic forces; light gage and plastic steel design. (2 lecture, 3 lab hours)

134. Foundation Design (3) (Former Engr 144)
Prerequisite: C E 123, 132 (or concurrently). Theory and design of footings, piles, retaining walls, and other structures combining the use of soil mechanics and structural analysis.

135. Reinforced Concrete Design (2)
Prerequisite: C E 132. Design of concrete structures; working stress, ultimate strength, and prestressed methods. (1 lecture, 3 lab hours)

140. Hydrology (3) (Former Engr 140)
Prerequisite: M E 116. The hydrologic cycle, atmospheric conditions, precipitation, infiltration, ground water, soil moisture, evaporation, runoff, streamflow, hydrographs, flood routing, hydrologic frequency analyses and their effects in water resource planning and management.

141. Water Resources Engineering (3) (Former Engr 141)
Prerequisite: M E 116. Planning, design, and operational aspects of water resources projects. (2 lecture, 3 lab hours; field trips required)

142. Water Supply and Wastewater Engineering (3) (Former Engr 142)
Prerequisite: M E 116. Design of urban water distribution, storm drainage, and sanitary sewer systems. Introduction to water purification and wastewater treatment processes. (Field trips required)

143. Engineering Hydraulics (3) (Former Engr 149)
Prerequisite: M E 116. Theory and analysis of pressure-conduit and open-channel flow systems. Applications to hydraulic structures and control works, hydraulic power conversion, sediment transport, and channel stabilization.

144. Water Quality Control (3) (Former Engr 177)
Prerequisite: C E 142 or senior-level chemical or biological science. Physical, chemical, and biological operations and processes in water quality control. Process and hydraulic design of water purification and wastewater treatment facilities. (Field trips required)

150. Transportation Planning and Design (3) (Former Engr 138, 125)
Prerequisite: C E 2. Transportation as a multimode system; functions, development, elements, and characteristics. Transportation planning; design of geometric elements of route and terminal. (2 lecture, 3 lab hours)

151. Pavement and Drainage Design (2) (Former Engr 126)
Prerequisite: C E 123 (or concurrently). Factors affecting drainage and load-bearing elements of transportation facilities. Capacity design of drainage facilities. Structural design of highway and airfield pavements.

152. Transportation Engineering Materials (2)
Prerequisite: C E 123. Soil stabilization with bitumen, lime, and portland cement for pavement construction; properties of bituminous road materials; properties, design, and testing of bituminous paving mixtures for pavement construction. (1 lecture, 3 lab hours; field trips required)

153. Traffic Operations and Control (2)
Prerequisite: C E 150 (or concurrently). Highway traffic characteristics and studies; regulation and control; administration. Air traffic control; railroad operation control.

180. Senior Project (1) (Former Engr 172)
Prerequisite: senior standing in civil engineering or in surveying and photogrammetry; approved subject; Engr 182 (or concurrently). Study of a problem under supervision of a faculty member; final typewritten report required. (Individual project except by special permission)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191T. Topics in Civil Engineering (1–3; max total 6) (Former Engr 191T)
Prerequisite: permission of instructor. Investigation of selected civil engineering subjects not in current courses.

ELECTRICAL ENGINEERING (E E)

104. Basic Electronics (3) (Former Engr 154)
Not open to electrical engineering majors. Prerequisite: Math 75, Phys 2B. Basic concepts of electronic circuits, oscillators, and high-frequency transmitters and receivers, with applications to measurements in surveying. (2 lecture, 3 lab hours)

106. Introduction to Switching Theory (3)
Prerequisite: Phys 2B. Axiomatic development of Boolean algebra; logic gates and memory elements; realization of Boolean networks; Boolean function minimization procedures; state assignment and state transitions; analysis and synthesis of linear sequential networks; synchronous and asynchronous behavior.

110. Magnetic and Electric Circuits (3) (Former Engr 150)
Prerequisite: Engr 70; Phys 4B; Math 81 (or concurrently). Fundamentals of magnetic circuits; basic laws of direct-current and of single and polyphase alternating-current circuits; transient phenomena in simple circuits; principles of electrical instruments; computer solutions.

110L. Magnetic and Electric Circuits Laboratory (1) (Former Engr 150L)
Prerequisite: E E 110 (or concurrently). Experiments on magnetic, direct- and alternating-current circuits, including single and polyphase systems. Use of electrical instruments, development of laboratory techniques, and verification of basic principles. (3 lab hours)

121. Electrical Machinery (3) (Former Engr 151)
Prerequisite: E E 110L. Principles of direct- and alternating-current machinery and other energy-conversion devices and associated apparatus.

121L. Electrical Machinery Laboratory (1) (Former Engr 151L)
Prerequisite: E E 121 (or concurrently). Experiments and computations on direct- and alternating-current machinery and on other energy-conversion devices and associated apparatus. (3 lab hours)

124. Electrical Circuit Analysis (3) (Former Engr 152)
Prerequisite: E E 110L. Introduction to the operational analysis of linear electric circuits and related systems; Laplace transformation; Fourier analysis; state-space representations; computer solutions.

124L. Electrical Circuit Analysis Laboratory (1) (Former Engr 152L)
Prerequisite: E E 124 (or concurrently). Experiments on linear electric networks, including response, transformations, and identification of circuits. (3 lab hours)

126. Electromagnetic Fields and Waves (3) (Former Engr 155)
Prerequisite: E E 110 (or concurrently). Electrostatic and magnetostatic fields, time-varying fields, Maxwell's equations, plane waves.

128. Electronic Devices and Circuits (3) (Former Engr 156)
Prerequisite: E E 110 (or concurrently). Physical electronics, characteristics and properties of electronic devices, both thermionic and solid state; theory and analysis of electronic circuits.

128L. Electronic Devices and Circuits Laboratory (1) (Former Engr 156L)
Prerequisite: E E 128 (or concurrently). Experiments on static and dynamic characteristics of electron tubes and solid-state devices, and on electronic circuits. (3 lab hours)

134. Information Transmission (3) (Former Engr 183)
Prerequisite: E E 124L. Mathematical modeling of signals and noise; information theory; modulation techniques; communications; information loss due to noise; digital communications; statistical communications theory.

136. Electromagnetic Energy Transmission (3) (Former Engr 153)
Prerequisite: E E 124L, 126. Principles of transmission of electromagnetic energy over wires at power and communication frequencies and through wave guides and space at ultra-high frequencies, filter circuits and antennas; design of transmission systems; computer solutions.

136L. Electromagnetic Energy Transmission Laboratory (1) (Former Engr 153L)
Prerequisite: E E 136 (or concurrently). Experiments on the transmission of electromagnetic energy through wires, wave guides, and space; filters and antennas; impedance matching; cross-over networks; location of faults on lines. (3 lab hours)

140. Pulse and Digital Circuits (3) (Former Engr 157)
Prerequisite: E E 124 (or concurrently), 128L. Design and analysis of wave-shaping, linear-sweep, electronic-gate, multistable, and negative-resistance circuits; Boolean algebra and digital logic design.

140L. Pulse and Digital Circuits Laboratory (1) (Former Engr 157L)
Prerequisite: E E 140 (or concurrently). Experiments on wave-shaping, switching, pulse, and digital circuits. (3 lab hours; field trips required)

151. Electrical Power Systems Analysis (3) (Former Engr 180)
Prerequisite: E E 121L, 128L, 136L (or concurrently). Power system networks and equipment, steady-state operation, short-circuit analysis, power system stability analysis by digital computation, synchronous generator excitation and governor systems, system load representation, numerical analysis techniques.

151L. Electrical Power Systems Analysis Laboratory (1) (Former Engr 180L)
Prerequisite: E E 151 (or concurrently). Experiments and demonstrations on power system apparatus; power system network analysis by digital computation; synchronous generator stability and control. (3 lab hours; field trips required)

155. Control Systems Analysis (3) (Former Engr 181)
Prerequisite: E E 124L or permission of instructor. Computerized analysis, design, and synthesis of linear feedback control systems; non-linear systems; sampled-data and optimal control systems; stability.

155L. Control Systems Analysis Laboratory (1) (Former Engr 181L)
Prerequisite: E E 155 (or concurrently). Experiments and demonstrations on control systems, including response, design, and stability criteria. (3 lab hours; field trips required)

161. Network Synthesis (3) (Former Engr 184)
Prerequisite: E E 124L. Characteristics of linear, passive, lumped-parameter systems; modern synthesis procedures for realizing driving-point and transfer functions of one-, two-, and n-terminal networks.

166. Microwave Devices and Circuits (3) (Former Engr 158)
Prerequisite: E E 136L. Microwave theory and techniques, propagation, wave guides, cavities, circuits, S-parameters, microwave devices including klystrons, traveling-wave tubes, magnetrons, and solid state devices.

166L. Microwave Devices and Circuits Laboratory (1) (Former Engr 158L)
Prerequisite: E E 166 (or concurrently). Microwave measurements selected from measurement of microwave power, standing-wave ratio, impedance, frequency, and klystron characteristics. (3 lab hours; field trips required)

169. Electromagnetic Measurements Laboratory (1) (Former Engr 159)
Prerequisite: E E 136L (or concurrently), 140L. Advanced experiments in precision measurement techniques and computations in electricity, magnetism, electronics, and electromagnetic fields and waves; modern error analysis techniques; computer solutions. (3 lab hours; field trips required)

171. Quantum Electronics (3) (Former Engr 185)
Prerequisite: E E 126. Review of wave properties; cavity mode theory; radiation laws; interaction of radiation and matter; laser amplifiers and oscillators; morphology of masers and lasers.

176. Computer-Aided Circuit Design (3)
Prerequisite: E E 124L, 128L. Digital computer methods in analysis and simulation of lumped parameter circuits; topological and matrix representation; modeling; time and frequency domain algorithms; optimization; worst-case and statistical analysis; use of problem oriented programs or circuit design. Introduction to system design.

180. Senior Project (1) (Former Engr 172)
Prerequisite: senior standing in electrical engineering; approved subject; Engr 182 (or concurrently). Study of problem under supervision of faculty member; final typewritten report required. (Individual project except by special permission)

189A-B. Developments in Engineering (1–1)
(A) Prerequisite: junior standing in engineering or permission of instructor. Presentations and discussions of developments in engineering. (B) Prerequisite: senior standing in engineering or permission of instructor. Presentations and discussions of advanced developments in modern engineering. (Field trips required)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191T. Topics in Electrical Engineering (1–3; max total 6) (Former Engr 191T)
Prerequisite: permission of instructor. Investigation of selected electrical engineering subjects not in current courses.

INDUSTRIAL ENGINEERING (I E)

110. Statistical Analysis and Control (3) (Former Engr 110)
Prerequisite: Math 76. Fundamentals of probability and statistics; general theory and practice of statistical quality control; sampling plans; introduction to statistical methods. (Field trips required)

111. Methods Analysis (2) (Former Engr 111)
General approach to the design process; application of design process to problem solving. Methods evaluation techniques: motion and time study, work sampling, and simulation. (2 2-hour lecture-labs; field trips required)

112. Statistical Design of Experiments (3) (Former Engr 112)
Prerequisite: I E 110, Engr 70. Analysis of variance; regression and correlation; analysis of covariance; randomized blocks and Latin squares; design of experiments; response surface analysis and determination of optimum conditions.

112L. Statistical Design of Experiments Laboratory (1) (Former Engr 112L)
Prerequisite: I E 112 (or concurrently.) Problem design and data analysis; experimental studies of statistical techniques.

113. Operations Analysis (3) (Former Engr 113)
Prerequisite: I E 110, Engr 70, Math 81. Application of quantitative and numerical techniques for analysis of complex operational problems.

114. Facilities Engineering (2) (Former Engr 114)
Value analysis, materials handling, packaging, layout of facilities, safety, location of facilities.

180. Senior Project (1) (Former Engr 172)
Prerequisite: senior standing in industrial engineering, approved subject, Engr 182 (or concurrently). Study of a problem under supervision of a faculty member; final typewritten report required. (Individual project except by special permission)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191T. Topics in Industrial Engineering (1–3; max total 6) (Former Engr 191T)
Prerequisite: permission of instructor. Investigation of selected industrial engineering subjects not in current courses.

MECHANICAL ENGINEERING (M E)

11. Manufacturing Processes (2) (Former Engr 11)
Processing techniques, including casting, welding, forming, and machining; capabilities and limitations of these techniques.

11L. Manufacturing Processes Laboratory (1) (Former Engr 11L)
Prerequisite: M E 11 (or concurrently). Application of existing and new processing techniques. (3 lab hours; field trips required)

31. Engineering Materials (2) (Former Engr 32)
Prerequisite or concurrently: C E 20, Chem 8. Fundamental nature and properties of engineering materials; structure of matter; mechanical, electrical, magnetic, and thermal properties.

112. Engineering Mechanics: Dynamics (3) (Former Engr 130)
Prerequisite: C E 20. Application of principles of kinematics and kinetics to problems in engineering.

116. Thermodynamics-Fluid Mechanics A (3) (Former Engr 164)
Prerequisite: M E 112 (or concurrently). Fundamentals of thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

116L. Thermodynamics-Fluid Mechanics Laboratory A (1) (Former Engr 164L)
Prerequisite: M E 116 (or concurrently). Applications of experimental methods used in engineering practice to thermo-fluid systems. (3 lab hours)

117. Instrumentation and Fluid Laboratory (2)
Prerequisite: M E 116 (or concurrently). Study of instrumentation and experimental methods; applications; fluid mechanics laboratory. (2 3-hour labs)

131. Advanced Engineering Materials (3) (Former Engr 136)
Prerequisite: M E 31, C E 121. Applications of the principles of materials science to the study of the mechanical behavior of metalic, polymeric, ceramic, and composite materials. Effects of stress and environmental variables. (2 lecture, 3 lab hours)

134. Mechanism (3) (Former Engr 121)
Prerequisite: M E 112, Engr 26. Analytical and graphical solutions of motion problems involving mechanical elements; synthesis of plane and space linkage systems. (2 3-hour lecture-labs)

136. Thermodynamics-Fluid Mechanics B (3) (Former Engr 165)
Prerequisite: M E 116. Continuation of M E 116. Fundamentals of thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

136L. Thermodynamics-Fluid Mechanics Laboratory B (1) (Former Engr 165L)
Prerequisite: M E 116L or 117, 136 (or concurrently). Applications of experimental methods as used in engineering practice to thermo-fluid systems. (3 lab hours)

137. Fluid Dynamic Machinery (3) (Former Engr 145)
Prerequisite: M E 136, 136L (or concurrently). Applications of principles of fluid mechanics and thermodynamics to the rotor-fluid energy interchange processes in fluid dynamic machines; axial and centrifugal pumps, compressors, and blowers; impulse (Pelton, Rateau), reaction (Francis, Parsons), and mixed flow turbines.

142. Mechanical Vibration (3) (Former Engr 124)
Prerequisite: M E 112, Math 81. Mathematical and physical basis of vibration theory with applications to engineering; transient and steady state phenomena; distributed and lumped parameters; coupled systems; computer solutions.

143. Mechanical Design Laboratory (1)
Prerequisite: M E 112, C E 121. Theory and techniques of static and dynamic measurements; experimental determination of strain, stress, displacement, velocity, acceleration, force; vibration measurements, experimental stress analysis. (3 lab hours)

144. Advanced Mechanics of Materials (3) (Former Engr 139)
Prerequisite: C E 121, Engr 70, Math 81. Advanced topics in mechanics of materials.

146. Air Conditioning (3) (Former Engr 162)
Prerequisite: M E 136 (or concurrently). Theory and practice in air conditioning including psychrometrics, load estimating, heating and cooling systems, fluid design and controls.

146L. Air Conditioning Laboratory (1) (Former Engr 162L)
Prerequisite: M E 146 (or concurrently). Practical laboratory work with commercial type units; test of components of air conditioning systems. (3 lab hours; field trips required)

151. Materials Engineering (2)
Prerequisite: M E 131. Techniques for selecting optimum materials for specific applications, evaluation of critical requirements, recognition of unknown factors, economic considerations. Modification of materials to meet requirements.

154. Machine Design (3) (Former Engr 122)
Prerequisite: M E 112, C E 121, Engr 70, Math 81. Analytical study of machinery; applications to design of machines; use of computers in design problems.

156. Advanced Thermodynamics—Fluid Mechanics (3) (Former Engr 166)
Prerequisite: M E 136. Advanced topics in thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

156L. Advanced Thermodynamics—Fluid Mechanics Laboratory (1) (Former Engr 166L)
Prerequisite: M E 136L, 156 (or concurrently). Applications of advanced experimental methods used in engineering practice to thermo-fluid systems. (3 lab hours)

164. Advanced Mechanical Design (2) (Former Engr 123)
Prerequisite: M E 134, 154. Analytical study of dynamics of machinery; applications to design problems. (2 2-hour lecture-labs)

180. Senior Project (1) (Former Engr 172)
Prerequisite: senior standing in mechanical engineering, approved subject, Engr 182 (or concurrently). Study of a problem under supervision of a faculty member; final typewritten report required. (Individual project except by special permission)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191T. Topics in Mechanical Engineering (1–3; max total 6) (Former Engr 191T)
Prerequisite: permission of instructor. Investigation of selected mechanical engineering subjects not in current courses.

IN-SERVICE COURSES

(See *Course Numbering System*)

311. Professional Examination Review (2; may be repeated in different fields)

321. Professional Engineering Seminar (1–3; may be repeated in different fields)

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SCHOOL OF HUMANITIES

GENERAL 191
ART DEPARTMENT 192
ENGLISH DEPARTMENT 198
FOREIGN LANGUAGE DEPARTMENT 203
LINGUISTICS DEPARTMENT 215
PHILOSOPHY DEPARTMENT 218

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SCHOOL OF HUMANITIES

James F. Light, Dean

Department	*Chairman*
Art	Wesley M. Williams, fall; Laury, spring
English	Lillian Faderman
Foreign Language	Jose A. Elgorriaga
Linguistics	Edward R. Gammon
Philosophy	J. Marvin Smith

Opportunities in the School of Humanities exist for students who wish to major or minor in any of the five departments, or who desire to take courses in any of the disciplines to meet general education requirements. The courses designed for general education treat their subject matter from a substantive point of view so that an understanding of the course content contributes to the understanding of the problems of an individual as well as the modern world.

The curriculum for each of the departments consists of introductory and developmental courses on the lower division level and a series of upper division courses for each area of study.

Upper division work in the various departments of the school is designed primarily to meet the needs of major, minor, or graduate students. Each department except Philosophy offers a master of arts degree program. For specific information concerning courses that meet requirements for general education, teaching credentials, degree programs (baccalaureate or master), consult the chairman of the department of the area of interest.

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ART DEPARTMENT

Professor: W. Williams (Chairman, fall)
Associate Professors: H. Kusel, Laury (Chairman, spring), Aiken, Delaney, Lund, Maughelli, Minschew, Opper, Smalley
Assistant Professors: L. Anderson, Bertoldi, Dangelo, Dolarian, Gaines, Hui, Lockwood, McDougall, Reichert, Shore, G. Thompson
Lecturers: T. Allen, Strumwasser, Yokoi
Part-time: Cobos, Griffith, D. Henderson, Howell, Lassig, Levin, Miller, Montanez, Vargas, Willett

The Art Department offers a major in art which leads to a bachelor's degree and a program leading to the master's degree. The program for art majors and minors is designed to provide a liberal arts education and is not directed toward providing terminal vocational or professional training at the undergraduate level.

The department reserves the right to hold projects completed by a student for class credit for a period of three years and to retain for the permanent collection of its gallery such examples as may be selected.

The department cooperates with other departments in providing for a concentration in Asian Studies and Latin American Studies. (See *Special Programs—Asian Area Courses; Latin American Studies)*

MAJOR

The major in art for the bachelor of arts degree provides for the study of art in practice, history and theory. It is designed to prepare a student for post-graduate studies. The major consists of 26 upper division units in art (at least 6 of which must be in art history and 6 in studio area. A maximum of 12 units in one studio area may be applied to the major.) The student will propose a program which is appropriate to his needs and interests in consultation with his adviser. The areas of concentration offered by the Art Department include, but are not limited to: drawing, painting, ceramics, sculpture, photography, design, crafts, printmaking, and art history.

MINOR

The minor consists of 20 upper division art units (at least 3 of which must be in art history). The student will propose a program in consultation with his Art Department adviser.

CREDENTIAL PROGRAM

A student is admitted to practice teaching in art only after departmental screening. For information on the current credential program consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in art is based upon the equivalent of the undergraduate major in art at Fresno State . The program provides specifically for certain nonvocational areas of concentration: photography, crafts, design, drawing, painting, ceramics, sculpture, art history, and theory. For specific requirements consult the chairman of the departmental graduate committee; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area III:* Art 1, 5, 6, 10, 12, 15, 16, 20T, 25, 30, 41, 46, 51, 56, 60, 65, 70, 105T, 160, 168, 170, 171, 173, 174, 175, 176, 177, 178, 179. (See *General Education—Courses.)*

COURSES

ART

1. Art Forms (3)
Description and investigation of traditional and contemporary art forms. (6 lecture-lab hours)

5. History of Art I (3) (Former Art 119)
Western art forms from prehistory to the 13th century including Egypt, Mesopotamia, Greece, Rome, Medieval, Romanesque and Gothic.

6. History of Art II (3) (Former Art 119)
Western art from the 13th to the 19th century, including Renaissance, Baroque and Rococo.

10. History of Art III (3)
Western art forms from 1800 to the present.

12. Ceramics (3) (Former Art 20.2)
A survey of ceramic materials and their functions in the arts. Basic studio practices in the handbuilding processes, glazing, and throwing on the potter's wheel. (6 lecture-lab hours)

15. Drawing (3) (Former Art 20.0)
Introductory course in drawing concepts, materials and techniques. (6 lecture-lab hours)

16. Figure Drawing (3) (Former Art 20.1)
Introductory course in the basic concepts of figure drawing problems and techniques. (6 lecture-lab hours)

20T. Studio Processes (3; max total 3 per area)
Specific studio processes not normally covered in regular course offerings. Areas offered may be: drawing, painting, ceramics, sculpture, photography, printmaking, design, crafts. (6 lecture-lab hours)

25. Painting (3) (Former Art 20.1)
Introduction to painting processes through studio problems and critiques. (6 lecture-lab hours)

30. Philosophies of the Visual Arts (3)
Visual representation of past and present art movements.

41. Design: Interaction of Color (3) (Former Art 20.6)
Interaction of color as developed by Joseph Albers; basic design principles in connection with color work. (6 lecture-lab hours)

46. Design (3) (Former Art 20.6)
Exploration of basic art concepts through two- and three-dimensional design problems. (6 lecture-lab hours)

51. Sculpture I (3) (Former Art 20.3)
Introductory course in materials and concepts. (6 lecture-lab hours)

56. Printmaking (3) (Former Art 20.5)
Introductory experience in the basic graphic processes such as woodblock, etching, engraving, lithography. (6 lecture-lab hours)

60. Art Tours (3)
Directed trips to galleries, museums, and other places of interest to the student of art; half of the semester devoted to studio projects, half devoted to out-of-town tours. Assigned papers, projects, and discussion. Chartered travel costs will be approximately $40. (6 lecture-lab hours)

65. Crafts (3) (Former Art 20.7)
Fundamental exploration of several media (fiber, wood, leather) with emphasis on understanding the potential of the various materials. (6 lecture-lab hours)

70. Photography (3) (Former Art 20.4)
Introductory course in black and white photography. Basic theoretical and practical aspects of the photographic process relevant to the medium as an art form. (2 lecture, 3 lab hours)

105T. Topics in Art History (3; max total 3 per area)
Specific areas in art history not normally covered in the regular course offering. Possible topical areas include African, Pre-Columbian, Primitive, Early Migrations, American Indians, Buddhism, Chinese Painting, Happenings, Cinematography, Picasso, Duchamp.

109. Design (3) (Former Art 120.6)
Prerequisite: Art 41 or 46, permission of instructor. Continuation of the exploration of two- and three-dimensional design problems. (6 lecture-lab hours)

117. Advanced Figure Drawing (3; max total 12) (Former Art 120.01)
Prerequisite: Art 16, permission of instructor. The human figure and its relevancy to advanced drawing concepts and techniques; emphasis on individual exploration in studio problems. (6 lecture-lab hours)

120T. Topics in Studio Processes (3; max total 12 in area)
Prerequisite: permission of instructor. Specific advanced studio processes not normally covered in regular course offerings. Areas offered may be: drawing, painting, ceramics, sculpture, photography, printmaking, design, crafts, motion-picture, art education, feminist art. (6 lecture-lab hours)

122. Museum Techniques (3) (Former Art 120.9)
Prerequisites: Art 41 or 46, permission of instructor. Introduction to museum practices related to exhibition selection, design, and installation techniques. Field trips, lectures, projects and critiques. (6 lecture-lab hours)

125. Advanced Drawing (3; max total 12) (Former 120.0)
Prerequisite: Art 15 or 16, permission of instructor. Investigation of advanced concepts through the techniques of the drawing medium. (6 lecture-lab hours)

127. Painting (3; max total 6) (Former Art 120.1)
Prerequisite: Art 25, permission of instructor. Individual investigation of advanced aesthetic concepts; continued search into personal direction. (6 lecture-lab hours)

128. Advanced Painting (3; max total 6) (Former Art 120.1)
Prerequisite: Art 127, permission of instructor. Designed primarily for students with two or more semesters of experience in painting. Emphasis on individual involvement in the painting process aiming toward advanced formal and technical expression. (6 lecture-lab hours)

136. Advanced Crafts (3) (Former Art 120.7)
Prerequisite: Art 65, permission of instructor. Advanced design in a variety of materials. Study of contemporary designer craftsmen. (6 lecture-lab hours)

137. Crafts: Textile Design (3; max total 6) (Former Art 120.7)
Prerequisite: Art 41, 46, or 65, permission of instructor. Design relating to fabrics, tie dye, batik, and silk screen. (6 lecture-lab hours)

138. Crafts: Advanced Textile Design (3; max total 6) (Former Art 120.7)
Prerequisite: Art 137, permission of instructor. Advanced design problems in processes related to textile designing. Emphasis on study in depth in a single process. (6 lecture-lab hours)

139. Crafts: Weaving (3; max total 12) (Former Art 120.7)
Prerequisite: Art 65, permission of instructor. Exploration of fiber as a creative medium. Loom building and experimentation with emphasis on technique, form, design, and sensitivity. (6 lecture-lab hours)

140. Crafts: Metals (3; max total 12) (Former Art 120.7)
Prerequisite: Art 65, permission of instructor. Exploration of nonferrous metals as creative medium with an emphasis on understanding and experimenting with basic techniques, fabrication, lost-wax casting. (6 lecture-lab hours)

146A-B-C-D. Photography (3–3–3–3) (Former Art 120.4)
Prerequisite: Art 70, permission of instructor. Advanced photography: sequential progression. May emphasize black and white color, history and appreciation, and individual productions. (2 lecture, 3 lab hours)

151. Sculpture (3) (Former Art 120.3)
Prerequisite: Art 51, permission of instructor. Introduction to materials and concepts. (6 lecture-lab hours)

152. Sculpture: Metal Casting (3; max total 6) (Former Art 120.3)
Prerequisite: Art 51, 151, permission of instructor. Introduction to metal casting. (6 lecture-lab hours)

153. Sculpture: Metal Fabrication (3; max total 6) (Former Art 120.3)
Prerequisite: Art 51, 151, permission of instructor. An introduction to metal construction methods. (6 lecture-lab hours)

154. Sculpture: Wood Fabrication (3; max total 6) (Former Art 120.3)
Prerequisite: Art 51, 151, permission of instructor. An introduction to wood working methods. (6 lecture-lab hours)

155. Sculpture: Mixed Media (3; max total 6) (Former Art 120.3)
Prerequisite: Art 51, 151, permission of instructor. Introduction to projects and concepts. (6 lecture-lab hours)

160. Art Tours (3; max total see below)
Prerequisite: permission of instructor. May be repeated for credit; no more than 3 units may be applied on the art major. Directed trips to galleries, museums and other places of interest to the student of art; half of the semester devoted to studio projects, half to out-of-town tours; assigned papers, studio projects, discussion. Chartered travel costs approximately $40. (6 lecture-lab hours)

161. Printmaking (3; max total 12) (Former Art 120.5)
Prerequisite: Art 56, permission of instructor. Advanced investigation in the graphic processes such as woodblock, etching, engraving, lithography. (6 lecture-lab hours)

164. Elementary Art Education (3) (Former Art 120.8)
Art materials, techniques, and teaching methods as they apply to the elementary school curriculum; introduction to current philosophies in art education, theories of the developmental phases of artistic expression in children. (6 lecture-lab hours)

165. Secondary Art Education (3) (Former Art 120.81)
Prerequisite: permission of instructor. For secondary credential candidates; immediately precedes student teaching. Concerns, attitudes, practices, and thoughts relevant to the preparation of the art teacher. (6 lecture-lab hours)

168. Ancient World (3) (Former Art 105.0)
Comparative study of art forms of the early civilization: Egypt, Mesopotamia, Crete, Greece, Rome.

170. Medieval Art History (3) (Former Art 105.1)
Study of the art forms of the western medieval period; particularly Romanesque building and sculptural forms.

171. Renaissance (3) (Former Art 105.2)
Comparative study of the northern and southern European art between the years 1250–1600. Slide identification required; student presentations on in-depth research topics.

173. Nineteenth Century Art History (3) (Former Art 105.4)
A study of painters and sculptors of the 19th century with particular emphasis on the precursors of modern art.

174. Twentieth Century Art History (3) (Former Art 105.5)
Development of paintings and sculpture of the 20th century; social, political, and philosophical implications on the artists of this period.

175. Contemporary Art History (3) (Former Art 105.5)
A critical and analytical evaluation of significant paintings and sculpture after WWII. Advanced topic discussion course; text supplemented by contemporary magazines.

176. American Art History (3) (Former Art 105.7)
A critical and analytical study of the art forms of America from Colonial times to 1945.

177. Indian-Asian Art History (3) (Former Art 105.6)
Investigation of the art of India-Asia in a cultural context.

178. Chinese Art History (3) (Former Art 105.8)
Investigation of the art of China in a cultural context.

179. Japanese Art History (3) (Former Art 105.63)
An investigation of the art of Japan in a cultural context.

180A-B. Scene Design and Theatre (3–3) (See Drama 180A-B)

181A-B. Costume Design for the Stage (3–3) (See Drama 181A–B)

182A-B. Stage and Television Lighting (3–3) (See Drama 182A-B)

183. Ceramics (3; max total 6) (Former Art 120.2)
Prerequisite: Art 12, permission of instructor. Advanced lab processes in throwing on the potter's wheel. Continued study on nontechnical glaze composition. Kiln stacking and firing.

184. Ceramics (3; max total 6) (Former Art 120.2)
Prerequisite: Art 183, permission of instructor. Individual projects in selected ceramic areas. (6 lecture-lab hours)

185. Ceramics (3; max total 6) (Former Art 120.2)
Prerequisite: Art 184, permission of instructor. Advanced study in ceramic art. (6 lecture-lab hours)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

220T. Topics in Studio Processes (3; max total 9)
Prerequisite: permission of instructor. Specific studio processes not normally covered in regular course offerings. Areas offered may be: drawing, painting, ceramics, sculpture, photography, printmaking, design, crafts, motion picture, art education.

225. Seminar in Art Education (3; max total 9)
Prerequisite: permission of instructor. Curriculum development; implications of recent research and philosophic inquiry on the subjective dimensions of art education.

230. Seminar in Art Theory (3; max total 9)
Prerequisite: permission of instructor. Theory and concepts in the visual arts; patterns and technique of art criticism; preparation, oral presentation, and defense of critical papers.

240. Seminar in Art Studio (3; max total 15, max 9 in one area)
Prerequisite: permission of instructor. Opportunity to work individually with selected staff in areas of specializations: sculpture, design, ceramics, photography, drawing and painting. Concurrent obligation to periodic seminars as scheduled by the instructor.

260. Seminar in Art History (3; max total 9)
Prerequisite: six units of art history or permission of instructor. Research problems in art history. Group or individual inquiry as determined by instructor.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

298. Exhibition (2–6; max total 6)
Prerequisite: permission of department graduate committee chairman. Preparation and exhibition of original works under the supervision of an Exhibition Committee of three faculty members. Students must pass an oral examination based on the work to be exhibited.

299. Thesis (2–6; max total 6)
Prerequisite: permission of chairman of Art Department Graduate Committee; see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

ENGLISH DEPARTMENT

Professors: Billings, Chittick, Everwine, Karr, Leavenworth, P. Levine, Logan, Lyon, O'Neil, Poss, Zumwalt

Associate Professors: Faderman (Chairman), Bluestein, W. Cowling, Hanzlicek, Hart, Kausch, McDermott, McKnight, Paul, Ries, Seib, Stuart

Assistant Professors: Crane, Frey, G. Lewis, Meinke, Pickering, Rosenthal, Shetzline, Simmons, Tate

Lecturers: Donaghy, Moskowitz

Part-time: Aycock, Backus, Cooke, Johansen, Hushaw, Milne, Nuefeld, Pape, Rhodus, Salerno

The English Department offers a major in literature, language, and writing leading to the bachelor of arts and master of arts degrees. For students majoring in other departments it provides courses of general interest in reading, composition of various kinds, and literature. A daily tutorial program is available to all students.

MAJOR

The major in English for the bachelor of arts degree provides for the study of English, American, and world literature, language studies, and creative writing. It will prepare students for postgraduate training in English and in business, law, medicine, theology, civil service, teaching, and in the other fields that recommend a grounding in the liberal arts as preparation for occupational training.

The major consists of 28 upper division units, including 4 units in English 193T or 189 and 4 units in English 191T, of which one section should be taken during each semester of the junior and senior years. English 193T should ordinarily not be taken until 3 upper division courses have been completed. English 134 may not apply toward the English major. Up to three courses (but not more than 10 units) of those linguistics courses which are cross-listed as English courses may apply toward the English major. Courses taken as PW may not apply to the major, with the exception of 4 units of 175T.

Not more than 6 units by extension and correspondence courses may be applied toward the English major; correspondence courses may be applied only if they are acceptable for the major at the college where the course is offered.

Students majoring in English are advised to select a course in English history as one of their upper division electives.

The student will propose a program in consultation with his adviser, selecting courses in appropriate proportions from among the following general categories: Literary History, Advanced Writing, Forms of Literature, Seminar in Literary Studies, Major Writers, and Linguistics.

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in English is based on an undergraduate major in English. An option in creative writing is available.

The student who plans to do graduate work in English at Fresno State should know that to earn his master's degree he is expected to have at least the following undergraduate or graduate courses: two courses in English literature, a course in American literature, a course in world literature, a course in Shakespeare, and a course in Chaucer. These area requirements may be satisfied while the undergraduate is working on his major. For other requirements consult the *Graduate Bulletin* and the departmental advisers; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

ADVANCED PLACEMENT

See *General Information—Advanced Placement*

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in English requires the passing of an examination demonstrating a reading knowledge of one foreign language.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area III:* Engl 20 (3 units), 41, 43, 44, 50T, 112–116, 146–148, 150–156, 161, 163, 164, 169T, 175T. *Area IV:* Engl 1, 20 (1 unit). (See *General Education—Courses)*

COURSES

ENGLISH (Engl)

Note: Engl 20 or equivalent is a prerequisite for all upper division English courses except Engl 175T and courses cross referenced to Linguistics.

1. Composition (3) (Equivalent to former Engl 3)
Not open to students with credit in Engl 3. Prerequisite: college-level competence in written English. Theory and practice of composition. Themes, chiefly expository or analytical; one paper based upon investigation of a selected topic.

20. Literature and Composition (4)
Reading and analysis of short stories, novels, drama, and poetry. Development of critical thinking and expression through individual projects and extensive writing under close supervision.

41. Poetry Writing (4) (Former Engl 40.1)
Prerequisite: Engl 20, or permission of instructor. Beginning workshop in the writing of poetry; appropriate reading and analyses.

43. Fiction Writing (4) (Former Engl 40.3)
Prerequisite: Engl 20, or permission of instructor. Beginning workshop in the writing of fiction; appropriate reading and analyses.

44. Nonfiction Prose Writing (4) (Former Engl 40T)
Prerequisite: Engl 20, or permission of instructor. Beginning workshop in nonfiction prose writing; appropriate reading and analyses.

50T. Studies in Literature (4; max total 8 if no topic repeated)
Sections designated as emphasizing certain writers, types, or themes, (for example, Shakespeare, The Poem, Literature of Protest, Women in Novels). Appropriate readings and analyses.

112. World Literature: Ancient (4) (Former Engl 159.8)
Discussion and close written analyses of comparative major works in translation.

113. World Literature: Medieval and Renaissance (4) (Former Engl 159.8)
Discussion and close written analyses of comparative major works in translation.

114. World Literature: Modern (4) (Former Engl 159.8)
Discussion and close written analyses of comparative major works in translation.

115. Religious Studies: Literature of the New Testament (3) (Former Engl 159.12) (See Phil 130T)
Discussion and close written analyses of selected Biblical texts.

116. Religious Studies: Literature of the Old Testament (3) (Former Engl 159.11) (See Phil 130T)
Discussion and close written analyses of the literature of the Old Testament.

131. Varieties of Modern English (4) (Former Ling 146. See Ling 131)

134. Structure of English (3) (See Ling 134)

135. General Linguistics (3) (See Ling 135)

137. American English (3) (See Ling 137)

138. History of the English Language (3) (See Ling 138)

146. Beowulf to Malory (4) (Former Engl 159.1)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

147. Renaissance (4) (Former Engl 159.2)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

148. Donne to Milton (4) (Former Engl 159.2)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

150. Dryden to Burns (4) (Former Engl 159.3)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

151. 19th Century Romantics (4) (Former Engl 159.4)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

152. Dickens to Hardy (4) (Former Engl 159.4)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

153. American Literature to Whitman (4) (Former Engl 159.5)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

154. American Literature 1865 to WWI (4) (Former Engl 159.5)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

155. 20th Century American Literature (4) (Former Engl 159.6)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

156. 20th Century British Literature (4) (Former Engl 159.7)
Discussion and close written analyses of major works and their backgrounds within a period of literary history.

161. Advanced Writing of Poetry (4; max total 8) (Former Engl 149.1)
Prerequisite: Engl 41, or permission of instructor. Intensive workshop in the writing of poetry; appropriate readings, and analyses.

163. Advanced Writing of Fiction (4; max total 8) (Former Engl 149.3)
Prerequisite: Engl 43, or permission of instructor. Intensive workshop in the writing of fiction; appropriate readings, and analyses.

164. Advanced Writing: Non-Fiction Prose (4; max total 8) (Former Engl 149.5)
Intensive workshop in expository writings; appropriate readings, and analyses.

169T. Forms of Literature (4; repeatable with different topics) (Former Engl 93)
No more than 12 units may be applied on the English major. Prerequisite: Engl 20 or equivalent. Sections designated as emphasizing poetry, drama, novel, short story, perhaps limited to a specific period or subclass (for example, 18th Century English Novel, 20th Century British and American Poetry, Modern Short Stories, 20th Century Drama, Tragedy, Folklore, Mythology, Women in Literature). Reading and close written analysis with particular attention to form.

175T. Lectures in Literature (1–4; max total 8, if no topic repeated)
No more than 4 units may apply to the English major. Lectures in a selected topic in literature or related fields by the regular faculty and/or visiting lecturers.

189. Shakespeare (4) (Former Engl 194.1, .2. Same as Drama 194T section)
Reading and written analyses of the major works of Shakespeare.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191T. Supervised Independent Reading (1–4; max total 4, if no topic repeated)
The student reads works from a literary period (for example, Beowulf to Marlowe, American Literature to Whitman, World Literature: Ancient and Medieval) and discusses them in individual conferences.

193T. Seminar in Literary Studies (4; repeatable with different topics) (Former Engl 140–145, 182, 185)
No more than 12 units may be applied on the English major. Sections designated by topic. Individual projects. Reading, discussion, and writing of papers centered on individual writers (for example, Milton, D.H. Lawrence), short periods of literary history (for example, Romantic Poets, Modern Novel), literary themes and traditions (for example, Transcendental Vein in American Literature, Arthurian Tradition) literary criticism (for example, Problems in Modern Criticism, Archetype and Myth), Myth and Archetype of Women, and other special topics.

GRADUATE COURSES (Engl)

(See *Course Numbering System—Definitions and Eligibility*)

250T. Seminar in Literature (4; max total 12 if no topic repeated)
Prerequisite: major or minor in English; permission of instructor. Seminar in an aspect of literary history: type, period, movement, or an individual author (for example, Fiction, Seventeenth Century Lyric Poetry, The Irish, Dickens).

261. Advanced Writing: Poetry (4; max total 12) (Former Engl 210T)
Prerequisite: permission of instructor. Advanced individual projects in the writing of poetry.

263. Advanced Writing: Fiction (4; max total 12) (Former Engl 210T)
Prerequisite: permission of instructor. Advanced individual projects in the writing of fiction.

264. Seminar in Rhetoric (4; max total 12 if no topic repeated) (Former Engl 220T)
Prerequisite: advanced composition or equivalent. Seminar in rhetorical theory in relation to social history, critical analysis of current rhetorical doctrine.

265. Advanced Writing: Expository (4; max total 12)
Prerequisite: permission of instructor. Advanced individual projects in expository writing.

280T. Seminar in Critical Theory (4; max total 12 if no topic repeated)
Prerequisite: major or minor in English; permission of instructor. Seminar in literary criticism (for example, Literary Critics).

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

291T. Supervised Independent Reading (1; max total 4 if no topic repeated)
The student reads works from a literary period (for example, More to Milton, 20th Century American Literature, World Literature, Renaissance-Modern) and discusses them in individual conferences.

299. Thesis or Project (2–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

300. English Colloquium (2; max total 6)

FOREIGN LANGUAGE DEPARTMENT

Professors: Elgorriaga (Chairman), Brenninger, Ensslin, Jasutis, L. Lewis, List, Nagy

Associate Professors: W. Bowen, Clough, Dmitriew, Doswald, Kinzel, McConnell, Poythress, Pronin, H. Roth, H. Tucker (Acting Chairman, spring)

Assistant Professors: Barta, Benitez, Freeman, Gendron, Gill, Ross, Saddler, Sauer, Slaniceanu, Stock

Lecturers: Audet, Martinez, J. Mas

Part-time: S. Heller, T. Hiller, Kalistratov, R. Saludes, M. Vinuela, E. Vostrak

The Foreign Language Department aims to teach students to understand, speak, read, and write the foreign languages offered, with varying degrees of emphasis upon those objectives according to their needs and interests; to promote an interest in and an understanding of foreign civilizations and of the problems of foreign nations as they arise day by day; to contribute to students' knowledge of English through comparative study of a foreign language; to prepare students to teach foreign languages in the elementary and secondary schools; and to give specialized professional training for positions such as interpreter, translator, consular representative, and foreign trade specialist. For majors or minors, the department recommends an overseas experience of academic and cultural studies. See *Special and Interdisciplinary Problems—International Program.*

CREDIT ALLOWANCE IN FOREIGN LANGUAGE

Students who wish to continue in a language taken in high school must consult an adviser for placement. College credit may be earned in any class in which the student is placed. See also *Degrees and Credentials—Foreign Language Requirement.*

ADVANCED PLACEMENT

See *General Information—Advanced Placement*

MAJORS AND MINORS

The appropriate 1A-B and 2A-B courses or their equivalent are required for major and minor programs in French, German, Russian, and Spanish; the French major and minor require, in addition, French 4A-B or equivalent. All majors except Russian, require upper division units only. The Spanish major requires 30 upper division units, but no specific courses in any area; the student is required to plan an acceptable program in consultation with his Spanish adviser.

MAJORS

French	*Units*
Fren 101, 102, 109A-B	12
French electives (ud)	15
	27

German	
Germ 101A-B, 112 A-B, 114	15
German electives (ud)	13
	28

Russian	
Russ 2A-B	8
Russ 101 (9 units), 110A-B, 118A-B	21
	29

Spanish *Units*

Upper division units in Spanish selected from the areas listed below 30

Area I. Language and Culture
Area II. Spanish Linguistics
Area III. Reading and Appreciation of Literature
Area IV. History of Hispanic Literature
Area V. Forms, Periods and Figures of Hispanic Literature

MINORS

Armenian *Units*

Arm 1A-B, 2A-B 16
Arm 111, 112, or 190 6
22

French

Elect from Fren 2A-B, 4A-B, 50A-B, or equivalent 10
Elect from Fren 101, 109A-B 3
French electives (ud) 9
22

German

Germ 2A-B 0–6
Germ 50A-B, 101A-B 10
German electives (ud) 12– 6
22

Latin

Lat 2A-B, 101A-B 12
Latin electives (ud) 9
21

Russian

Russ 1A-B, 2A-B 16
Russian electives (ud) 6
22

Spanish

Select from: Span 20A-B, 40A-B, 50A-B, 60A-B 10
Select from Area I, II 6
Select from Area III, IV, V 6
22

CREDENTIAL PROGRAM

For information on the *current* credential program consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The master of arts degree is granted in French, German, or Spanish. The graduate programs for the degree are based on the equivalent of the respective undergraduate majors in these areas at Fresno State. No new applicants for separate master of Arts degrees in French and German will be accepted. Students interested in graduate study see French and German options in Master of Arts degree in Linguistics. For specific requirements consult the *Graduate Bulletin* or the departmental graduate committee chairman; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area III:* Fren 109A-B, 110A-B, 111A-B, 112A-B, 118A-B, 148T, 160T, Germ 112A-B, 114, 116A-B, 118A-B, 146T, 160T, Grk 148, Lat 131, 132, 148, Russ 103T, 118A-B, 148A-B, Span 135, 163T, 164, 173, 176T, 177T. *Area IV:* Arm 1A-B, 2A-B, Fren 1A-B, 2A-B, 50A-B, Germ 1A-B, 2A-B, 50A-B, Grk 1A-B, Ital 1A-B, Latin 1A-B, 2A-B, Russ 1A-B, 2A-B, 50A-B, Span 1A-B, 20A-B, 40A-B, 50A-B. (See *General Education—Courses.*)

COURSES

ARMENIAN (Arm)

1A-B. Elementary Armenian (4-4) (1A. Former EXP 109)
Not open to students with previous training in Armenian. Beginning course of graded lessons acquainting the student with basic structure and pronunciation of Armenian through practice, reading, and writing.

2A-B. Intermediate Armenian (4-4)
Prerequisite: Arm 1A-B or X109A, B. Grammar review; selected readings; compositions and conversations on assigned topics; pronunciation drill.

111. Composition and Conversation (3)
Prerequisite: Arm 2B. Idioms, written translations in Armenian, compositions on assigned topics, oral exercises. Emphasis on grammar and syntax.

112. Advanced Composition and Conversation (3)
Prerequisite: Arm 111 or permission of instructor. Style in composition; written and oral reports on assigned topics.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

CHINESE (Chin)

See *Linguistics Department*

FOREIGN LANGUAGES (FL)

170T. Women Writers (3; max total 12) (Same as W S 170T)
Classical and modern woman characters and authors in the literature of France, Germany, Russia, Spain, and Spanish America. Read in translation.

FRENCH (Fren)

1A-B. Elementary French (4-4)
Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of French through practice in speaking, reading, and writing.

2A-B. Intermediate French (3-3)
Prerequisite: Fren 1B or equivalent. Development in oral French, reading, and writing.

4A-B. Intermediate Composition (2-2)
Fren 4A-B or equivalent required of all majors and minors at the intermediate level; optional for others. Prerequisite: Fren 1B or equivalent. Concentration on writing skills preparatory to upper division course work.

50A-B. Oral French (2-2)
Prerequisite: Fren 1B. May be taken concurrently with Fren 2A-B. Oral drill for pronunciation; conversation on assigned topics; brief talks, extemporaneous discussions. (2 lecture, 1 lab hour)

61. Scientific French Readings in the Natural Sciences (3)
Prerequisite: Fren 1B or equivalent. Selected readings in the sciences aimed at developing the ability to read current scientific journals in French.

71. French Readings in the Social Sciences (3)
Prerequisite: Fren 1B or equivalent. Selected readings in the social sciences for the development of reading ability.

101. Advanced Composition (3)
Prerequisite: Fren 2B and 4B or permission of instructor. Written assignments in French on varied topics. Emphasis on composition, style, and grammar.

102. Advanced Composition and Translation (3)
Prerequisite: Fren 101 or permission of instructor. Written assignments in French on varied literary topics, with emphasis on composition, style, and grammar complemented by an introduction to the problems and techniques of literary translation.

109A-B. Survey of French Literature (3-3)
Prerequisite: Fren 2B or permission of instructor. Principal movements and major figures in the development of French literature from the earliest periods to the present. Taught in French.

110A-B. Seventeenth Century French Literature (3-3)
Prerequisite: Fren 109A or permission of instructor. (A) The French Baroque. Representative readings of the Baroque novel, drama, and poetry. Evolution of the Baroque toward French Classicism. (B) French Classicism. Triumph of order and "rules". Molière, Racine, LaFontaine.

111A-B. Eighteenth Century French Literature (3-3)
Prerequisite: Fren 109A or permission of instructor. (A) Precursors of the Enlightenment (1680–1784): Fénelon, Bayle, Fontenelle, Marivaux, Prévost, Lesage, Montesquieu. (B) Confrontation and advent of new order (1748–1789): Voltaire, Diderot, Rousseau, Beaumarchais, Chénier.

112A-B. Nineteenth Century French Literature (3-3)
Prerequisite: Fren 109B or permission of instructor. (A) French romanticism, its manifestation in the writings of Chateaubriand, Lamartine, Vigny, Hugo, Musset; the advent of Parnasse and Symbolism. (B) The novel. (1830–1900) as a reflection of the values predominant in nineteenth century France; Balzac, Hugo, Stendahl, Flaubert, Zola.

118A-B. Twentieth Century French Literature (3-3)
Prerequisite: Fren 109B or permission of instructor. (A) Transition writers: Claudel, Valéry, Proust, Gide; Surrealist movement. (B) The "ethical" generation: Malraux, Sartre, Camus, Ionesco, Beckett. Innovators and esthetes: Butor, Duras, Genet, Robbe-Grillet.

120. French Civilization (3)
Prerequisite: Fren 2B or permission of instructor. Main currents of French culture, history, thought, customs, and institutions. Taught in French.

130. Phonetics and Pronunciation (3)
Prerequisite: Fren 2B or permission of instructor. Articulatory phonetics as a means to forming native French pronunciation habits. Emphasis upon the difficulties encountered by speakers of American English.

137. Applied Linguistics (3)
Prerequisite: Fren 2B and Ling 135 or permission of instructor. Phonological, morphological, syntactical, and lexical structure of French; conflicts with English structure; linguistics problems in design of teaching materials.

148T. Topics of French Literature in Translation (3; max *total* 9 if no topic repeated)
Three units credit may be applied to French major or minor upon request. Studies of literary movements, genres or major authors; selected readings, discussions, written analyses.

150. Advanced Conversation (3)
Prerequisite: intermediate French or permission of instructor. Intensive practice in oral expression in French. Emphasis on current affairs in France.

160T. Selected Literary Topics (3; max total 9)
Prerequisite: Fren 2B or permission of instructor. Analysis, discussion, and evaluation of specific genres, themes, movements, and literary problems. Conducted in French.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (Fren)

(See *Course Numbering System—Definitions and Eligibility*)

204. Literary Theory and Criticism (3)
Prerequisite: undergraduate major in French or permission of instructor. Critical approaches to literature; analysis of literary doctrines; techniques of research and bibliography.

211. Historical Linguistics (3) (Former FL 202)
Prerequisite: 24 upper division units in French or permission of instructor. History of the phonological, morphological, syntactical, and lexical development of the French language from its origins to the present, through study of representative texts.

212. Comparative Synchronic Linguistics (3) (Former FL 201)
Prerequisite: undergraduate major or permission of instructor. Language learning problems as seen through comparison of the structure of American English and French.

220T. Seminar in French Literature (3; max total 9 if no topic repeated) (Former FL 210)
Prerequisite: 24 upper division units in French or permission of instructor.

250. Directed Reading (3; max total 6)
Prerequisite: 24 upper division units in French or permission of instructor.

290. Independent Study (3; max total 6)
See *General Information—Independent Study.*

299. Thesis or Project (2–6; max total 6)
Prerequisite: *See Master's Degrees-Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

GERMAN (Germ)

1A-B. Elementary German (4–4)
Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of German through practice in speaking, reading, and writing.

2A-B. Intermediate German (3–3)
Prerequisite: Germ 1B or equivalent. (A) Grammar review; reading and conversation. (B) Reading in German literature, and practice in conversation.

40. Phonetics and Pronunciation (2)
Intensive drill in phonetics for pronunciation, enunciation, and intonation. Designed for, but not restricted to, students in music and speech who wish to use German for singing and declamatory purposes.

50A-B. Oral German (2–2)
Prerequisite: Germ 1B or permission of instructor. May be taken concurrently with Germ 2A. Conversation on assigned topics; brief talks by students; short scenes from plays. (2 lecture, 1 lab hour)

61. Literature of the Sciences (2)
Prerequisite: Germ 1B or equivalent. Selected readings in the Natural Sciences for developing scientific vocabularies.

71. Literature of the Social Sciences (2)
Prerequisite: Germ 1B or equivalent. Selected readings in the social sciences for developing special vocabulary and translation skills; use of standard periodicals.

101A-B. Composition and Conversation (3–3)
Prerequisite: Germ 2B or permission of instructor. Idioms; written translations in German; compositions on assigned topics; oral exercises. Emphasis on grammar and syntax.

102. Advanced Composition and Conversation (2; max total 4)
Prerequisite: Germ 101A-B or permission of instructor. Emphasis on style in composition; written and oral reports on assigned topics.

103. German Culture (3)
Prerequisite: Germ 2B or permission of instructor. Cultural values of the German people: readings, lectures, films, and other media. Written and oral reports by students.

112A-B. German Literature, 700 to Present (3–3)
Prerequisite: German 2B or permission of instructor. Lectures and discussions; selected readings. (A) Not open to students with credit in German 115A. From 700 to 1750. (B) From 1750 to present.

114. Classical Age of German Literature (3)
Not open to students with credit in German 115B. Prerequisite: German 2B or permission of instructor. Reading and discussion of representative writings of Lessing, Goethe, and Schiller.

116A-B. Nineteenth Century Literature (3–3)
Prerequisite: Germ 2B or permission of instructor. Reading and discussion of representative selections from Tieck, Eichendorff, Hoffmann, Grimm, Kleist, Heine, Grillparzer, Keller, Hauptmann, Sudermann.

118A-B. Twentieth Century Literature (3–3)
Prerequisite: Germ 2B or permission of instructor. Analytical and critical study of twentieth century literary production of Germany. Outside readings and one written report each semester.

135. History of the German Language (3)
Prerequisite: five units of upper division German or permission of instructor. Development of the German Language from earliest times to the present.

137. Linguistics (3)
Prerequisite: five units of upper division German or permission of instructor. Analysis of the phonological, morphological, syntactical, and lexical structure of German; conflicts with English structure; linguistic problems and reports.

146T. Germanic Literature in Translation (3; max total 12 if no topic repeated) (Former German 148A-B)
Credit may not be applied to German major and minor requirements. Prerequisite: upper division standing or permission of instructor. Lectures, discussions, and written analysis of Germanic authors, movements, and themes.

160T. Selected Literary Topics (3; max total 9)
Prerequisite: six units upper division German or permission of instructor. Intensive study of significant topics through selected literary texts; analysis, discussion, and evaluation of specific genres, themes, movements, and literary problems.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (Germ)

(See *Course Numbering System—Definitions and Eligibility*)

120G. German Grammar for Reading (2)
Intensive study of grammar to prepare master's degree candidates to read in their fields.

125G. German for Graduate Students (2) (Former FL 125G)
Prerequisite: Germ 1B or Germ 120G or permission of instructor. Intensive reading and grammar review to prepare master's degree candidates for German language examination in their fields.

200. Seminar in Literary Criticism (3) (Former FL 200)
Prerequisite: completion of an undergraduate major in German or permission of instructor. Methods of literary criticism and techniques of bibliography.

220T. Seminar in Literature (3; max total 12 if no topic repeated)
Prerequisite: completion of an undergraduate major in German or permission of instructor. Study of an aspect of literary history: genre, period, movement, or individual author.

230. Seminar in Middle High German (3)
Prerequisite: German 135 or permission of instructor. Studies in Middle High German language and analysis of literary texts.

240T. Seminar in Germanic Languages (3; max total 12 if no topic repeated)
Prerequisite: German 230 or permission of instructor. Study of older Germanic languages and special linguistic problems.

290. Independent Study (1–3)
See *General Information—Independent Study.*

299. Thesis or Project (2–6)
Prerequisite: see *Master's Degrees-Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

GREEK (Grk)

1A-B. Elementary Greek (3–3)
Study of the fundamentals of the Greek language with practice in the reading and writing of Greek.

148. Greek Literature in Translation (3)
Analysis of selected works of major Greek poets, writers and thinkers from Homer to Lucian. Lectures, discussions, reports on readings.

ITALIAN (Ital)

1A-B. Elementary Italian (3–3)
Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Italian through practice in speaking, reading, and writing.

JAPANESE (Japn)

See *Linguistics Department.*

LATIN (Latin)

1A-B. Elementary Latin (3–3)
Elements of Latin grammar with its practical relation to Romance languages and English. Background study: Roman culture and its relevancy to the Western world.

2A-B. Intermediate Latin (3–3)
Prerequisite: Latin 1B or equivalent. Intensive study of grammar and syntax; use of the subjunctive mood in clause construction. Selected readings from Latin authors.

31. Latin and Greek for English Vocabulary (3)
Previous knowledge of Latin and Greek unnecessary. Analysis of Latin and Greek elements in English works; emphasis on practical use.

101A-B. Advanced Grammar and Composition (3–3)
Prerequisite: Latin 2B or equivalent; may be taken concurrently with Latin 131, 132, 141, or 142. Exercises in grammar and sentence construction.

131. Classical Latin (3)
Prerequisite: Latin 2B. Survey of Roman literature; readings in prose and poetry of representative authors from Plautus to Apuleius.

132. Medieval and Renaissance Latin (3)
Prerequisite: Latin 2B. Survey of Medieval and Renaissance Latin literature. Readings in Medieval history, *Gesta Romanorum*, Erasmus, Luther, Morus; supplementary readings in English on political and cultural backgrounds.

148. Roman Literature in English Translation (3)
Analysis of selected works of major Roman authors from Plautus to St. Augustine. Lectures, discussions, readings.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

PORTUGUESE (Port)

1A-B. Elementary Portuguese (3–3)
Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Portuguese through practice in speaking, reading, and writing.

RUSSIAN (Russ)

1A-B. Elementary Russian (4–4)
Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Russian through practice in speaking, reading, and writing.

2A-B. Intermediate Russian (4–4)
Prerequisite: Russ 1B or equivalent as determined by examination. (A) Review of grammar and syntax; composition; oral practice; reading of short stories. (B) Oral and written composition. Conducted in Russian.

27T. Soviet Russian Topics (3; max total 9)
Sections designated as emphasizing Russian folk arts, Russian underground, emigre works, and studies of the Soviet Press; lectures illustrated with films and other audio-visual media. Taught in English.

50A-B. Oral Russian (2–2)
Prerequisite: Russ 1B, 2A, or 2B. Oral drill for intonation and pronunciation; conversation on assigned topics, brief talks; extemporaneous discussions. (2 lecture, 1 lab hour)

101. Composition and Conversation (3; max total 9)
Prerequisite: Russ 2B or equivalent. Continuation of prose composition and oral-aural practice for mastery of the finer points in grammar and syntax.

103T. Topics in Russian Culture (3; max total 9)
Credit may not be applied to Russian major and minor requirements. Sections designated as emphasizing Russian-Soviet culture and Socialist realism. Lectures illustrated with films and other audio-visual media. Taught in English.

110A-B-C. Russian Literature to 1900 (3–3–3)
(A) From Chronicles to Romanticism; the Kiev and Moscow periods; verse, drama, fiction. (B) the novelists from 1830 to 1860. (C) Realism through Chekhov, Dostoyevsky, Tolstoy; Idealism and Materialism. Readings and reports in Russian and English. Conducted in Russian.

118A-B. Twentieth Century Literature (3–3)
Prerequisite: Russ 2B or equivalent. Analytical and critical study of the twentieth century literary production of Russia. Outside readings.

148A-B. Russian Literature in Translation (3–3)
Credit may not be applied to Russian major and minor requirements. Prerequisite: upper division standing or permission of instructor. Selective readings of major Russian literary works. Lecture, discussion. (A) Pushkin, Tolstoy, Dostoyevski. (B) Nobel prize winners: Solzhenitzyn, Pasternak, Sholokhov.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

SPANISH (Span)

1A-B. Elementary Spanish (4–4)
Beginning course to acquaint the student with the basic structure; emphasis on correct pronunciation and comprehension of oral Spanish.

20A-B. Reading and Speaking Spanish (3–3) (Former Span 2A-B)
Prerequisite: Span 1B or permission of instructor. Development of the student's ability in oral Spanish, reading, and writing. Emphasis on development of conversational skills; includes some grammar, writing, and reading. Spanish 50A-B or 60A-B may be substituted for Span 20B.

40A-B. Spanish for the Bilingual Student (3–3) (Former Span 4A-B. Same as La R 40A-B)
For students with a bilingual background. Emphasis on reading and conversation; some grammar review and writing. Span 20A-B or Span 60A-B may be substituted for Span 40B.

50A-B. Spanish for conversation (2–2)
Prerequisite: Span 1B or permission of instructor. Emphasis on spoken Spanish; development of oral fluency through panel discussions, short talks, small group conversations. Readings secondary to conversation; oral examinations. Span 20A-B or 60A-B may be substituted for Span 50B.

60A-B. Spanish for Reading (3–3)
Prerequisite: Span 1B or permission of instructor. Reading selections from Spanish newspapers and magazines; progression to concentration on reading within the student's area of interest; emphasis on development of reading skills. Span 50A-B or 20A-B may be substituted for Span 60B. Conducted in Spanish.

AREA 1. LANGUAGE AND CULTURE

120. Intermediate Composition (3) (Former Span 101)
Prerequisite: Span 20B, 40B, 50B, 60B, or permission of instructor. Original compositions; analysis of basic stylistic elements. Conducted in Spanish.

121. Advanced Composition (3)
Prerequisite: Span 120 or permission of instructor. Creative written composition with special attention to problems of style.

122. Advanced Grammar (3)
Prerequisite: Span 20B, 40B, 50B, 60B or permission of instructor. Functional grammar review. Analysis of grammatical constructions.

123. Advanced Conversation and Reading (3)
Reading of current periodicals and newspapers. Conversation on current topics.

125. Spanish Culture (3)
Examination of the cultural values of Spain through readings, lectures, films, and other media. Frequent written and oral reports by students.

126. Spanish-American Culture (3) (Former Span 102)
Examination of the cultural values of Spanish-America through readings, lectures, films, and other media. Oral and written participation by students.

AREA II. SPANISH LINGUISTICS

130. Phonetics and Pronunciation (3)
Practice and Theory: Introduction to phonetics and phonemics. Analysis of Spanish phonology. Emphasis on the difficulties encountered by English speakers. (3 lecture, 1 lab hour)

132. Spanish for the Bilingual Child (3)
Practical application of linguistic theory to the design of bilingual materials. Analysis of the predictable language learning problems encountered by the bilingual student.

133. Contrastive Structures of Spanish and English (3) (Former EXP 167)
Taken concurrently with Ling 133, except with permission of instructor. An analysis of the phonology, morphology, and syntax of Spanish with a view toward providing a contrastive analysis of Spanish and English. Emphasis on similarities, differences, and problems of language acquisition.

135. History of the Spanish Language (3)
Study of the linguistic changes in the evolution of Spanish from Vulgar Latin to modern Spanish. Development of the lexicon of the language showing the influence of the various inhabitants of Spain.

136. Children's Literature in Spanish (3)
Study of children's literature written or available in Spanish; emphasis on predictable difficulties encountered in using such materials in a bilingual teaching situation.

137. Applied Linguistics (3)
Prerequisite: Span 133 or Ling 133, 134, or 135. Practical application of linguistic theory to the design of teaching materials and to the solution of predictable language learning problems.

139. Spanish of the American Southwest (3)
Study of the Spanish spoken in the Southwest including the linguistic, social, and cultural determinants. Emphasis on the Spanish of the San Joaquin Valley.

AREA III. READING AND APPRECIATION OF LITERATURE

140. Reading and Appreciation of the Novel (3)
Reading and analysis of Hispanic novel to familiarize the student with the novel as an art form.

141. Reading and Appreciation of Hispanic Poetry (3)
Reading and appreciation of Hispanic poetry to familiarize the student with poetry as an art form.

AREA IV. HISTORY OF HISPANIC LITERATURE

150. Spanish Literature from El Cid to Calderon (3) (Former Span 103A)
Presentation of the major authors and works of the Spanish Middle Ages, Renaissance, and Baroque periods.

151. Spanish Literature from Feijoo to Present (3) (Former Span 103B)
Presentation of the principal authors, works, and movements of Spanish Literature from 1700 to the present.

153. Spanish-American Literature from Pre-Columbian to Naturalism (3) (Former Span 104A)
Principal authors, works, and movements of Spanish-American literature from the discovery of America to 1888.

154. Spanish-American Literature from Modernism to Present (3) (Former Span 104B)
Principal authors, works, and movements of Spanish-American literature from 1888 to the present.

AREA V. FORMS, PERIODS, AND FIGURES OF HISPANIC LITERATURE

160. Spanish Literature of the Middle Ages (3)
Study of main genres of Medieval Spanish literature with emphasis on at least one representative work from each.

161. Evolution of the Picaresque Novel (3)
Intensive study of the structure and meaning of such picaresque novels as *El Lazarillo, El Buscón, Rinconete y Cortadillo, El Periquillo Sarniento.*

163T. Spanish Literature of the Golden Age (3; max total 6 if no topic repeated) (Former Span 106, 162, 163)
Study of the "comedia" as represented by such dramatists as Lope, Cervantes, Tirso, and Calderón; the work of such poets as Garcilaso de la Vega, San Juan de la Cruz, and Luis de Góngora.

164. Spanish Literature of the Nineteenth Century (3)
Detailed study of selected works, authors, movements, and genres of the nineteenth century.

165. Experimental Novel of Generation of '98 (3)
Study of the novel of Azoriń, Baroja, Unamuno, Valle Inclán, with particular attention their experimentation with form and style.

166T. Twentieth Century Spanish Literature (3; max total 6 if no topic repeated) (Former Span 108, 166, 167)
Readings and discussion of such poets as Machado, Lorca, and Hernández and of such dramatists as Benavente, Valle-Inclán, Lorca, Buero Vallejo, and Alfonso Sastre.

173. Mexican Literature (3)
Study of the works of such major Mexican literary figures as Sor Juana, Gutiérrez Nájera, Azuela, and Fuentes.

174. Argentine Literature (3)
Study of the works of such major Argentine literary figures as Hernández, Gúiraldes, Lugones, Mallea, and Borges.

175. The Hispanic Essay (3)
Study of representative essayists of Spain and Spanish-America to illustrate the intellectual, ideological, and literary development of Hispanic culture.

176T. Twentieth Century Spanish-American Literature (3; max total 6 if no topic repeated) (Former Span 105, 107, 171, 172)
Intensive study of selected Spanish-American works including writings of Azuela, Fuentes, Carpentier, Vargas Llosa; outstanding poets such as Neruda, Vallejo, and Paz.

177T. Hispanic Literature in Translation (3; max total 6 if no topic repeated) (Former Span 148A-B, 177, 178)
Credit may not be applied to Spanish major and minor requirements. Intensive study of outstanding works of Hispanic literature.

180T. Major Figures in Hispanic Literature (3; max total 6 if no topic repeated)
Reading and analysis of the works of one major Hispanic author such as Cervantes, Unamuno, Neruda.

190. Independent Study (1-3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (Span)

(See *Course Numbering System—Definitions and Eligibility*)

203. Bibliography and Literary Criticism (3) (Former FL 200)
Discussion and application of methods and techniques in research. Analysis and application of the methods of literary criticism with consideration given to critical approaches in Spain and Spanish America.

205. Cervantes (3)
Intensive study of Don Quixote and other Cervantes' works with special consideration of sources, textual problems, and various critical approaches.

220. Hispanic Linguistics (3; max total 9 if no topic repeated) (Former FL 202)
In-depth analysis of the Spanish language through the study of the following areas: diachronic linguistics, synchronic linguistics, and dialectology.

230. Spanish Literature (3; max total 15 if no topic repeated) (Former FL 210)
Seminar in critique and analytical study of selected topics, genres or specific literary figures in each of the following areas: Medieval Period, Renaissance Period, Golden Age, 18th-19th Century, and 20th Century.

240. Spanish American Literature (3; max total 9 if no topic repeated) (Former FL 210)
Seminar in critique and analytical study of selected topics, genres or specific literary figures in each of the following areas: Colonial Period to 1810, 19th Century to 1910, 20th Century.

250. Directed Reading (3; max total 6)
Reading of works from a selected reading list in preparation for comprehensive master's degree examination.

290. Independent Study (2-3; max total 6)
See *General Information—Independent Study.*

299. Thesis or Project (3-6; max total 6)
Prerequisite: See *Master's Degrees-Thesis Requirement.* Preparation, completion and submission of an acceptable thesis or project for the completion of the Master's degree.

IN-SERVICE COURSES

(See *Course Numbering System.*)

301. Conversation and Composition Review (2; max total 8 if no language repeated)

304. Theory and Practice (2; max total 8)

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LINGUISTICS DEPARTMENT

Professor: Brengelman

Associate Professors: Gammon (Chairman), Weitzman, Wohl

Assistant Professors: Hopkins, Mistry, Raney, Romero, Wang, Zeldis

The Linguistics Department offers a minor in linguistics, a bachelor's degree in linguistics in bilingual studies, and programs in general and applied linguistics leading to the master's degree. Courses are provided in language description relevant to the social and behavioral sciences and to the teaching of English and foreign languages.

BACHELOR OF ARTS DEGREE

The bachelor of arts degree is offered in linguistics in bilingual studies: Spanish-English Bilingualism, Black Dialectology, and Teaching English as a Second Language. For details consult the departmental adviser.

MINOR

A minor consists of 22 units; consult the departmental adviser.

CREDENTIAL PROGRAM

For information on the current credential program, consult the departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The master of arts degree in linguistics is open to students with undergraduate majors in foreign language, English, anthropology, psychology, philosophy, mathematics, and other related fields. For specific requirements consult the *Graduate Bulletin* and the departmental adviser for the master of arts degree; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program, See the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

Advancement to candidacy for the master of arts degree in linguistics requires the passing of an examination demonstrating a reading knowledge of one foreign language.

Emphasis in French or German

The master of arts degree in linguistics with emphasis in French or German is open to students with suitable backgrounds in the French or German languages. For details consult the *Graduate Bulletin* and the departmental adviser.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements: *Area III:* Ling 134, 135, 137, 138. *Area IV:* Chin 1A-B, 2A-B; Japn 1A-B, 2A-B; Ling 142, 143. *Area V:* Ling 140T, 144. (See *General Education—Courses.*)

COURSES

LINGUISTICS (Ling)

131. Varieties of Modern English (4) (Same as Engl 131. Former Ling 146)
The regional, social, and stylistic varieties of modern English. Emphasis on Black dialect and on the English of Mexican-Americans.

133. Contrastive Structures of English and Spanish (3) (Former EXP 167)
Prerequisite: Span 2B or equivalent. Fulfills same requirements as Ling 134. Concurrent registration in Span 133 required unless waived by instructor. An analysis of the phonology, morphology and syntax of English with a view toward providing a contrastive analysis of English and Spanish, emphasizing points of similarity and difference.

134. Structure of English (3) (Same as Engl, Spch 134)
Not applicable to the English major. Satisfies the credential advanced composition requirements. Scientific study of English phonology, morphology, syntax, spelling, and punctuation.

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135. General Linguistics (3) (Same as Engl, Spch 135)
Descriptive and historical linguistics; relationships between language and culture.

137. American English (3) (Same as Engl, Spch 137)
Prerequisite: Ling 134 or 135. Studies in the linguistic structure of modern English.

138. History of the English Language (3) (Same as Engl 138)
Empirical study of the development of the sound system, grammar, and vocabulary of English.

140T. Topics in Linguistics (1-4; max total 12 if no topic repeated) (Former Ling 139)
Topics to be offered at the discretion of the department: historical, contrastive, mathematical, and other areas of linguistics.

141. English as a Foreign Language (3) (Former Ling 140.1)
Techniques of teaching English as a foreign language.

142. Phonology (4; max total 8 if no topic repeated) (Former Ling 139A)
Prerequisite: Ling 135. Study of phonetic feature of languages; phonetic, phonemic, and practical alphabets.

143. Syntax (4; max total 8 if no topic repeated) (Former Ling 139B)
Prerequisite: Ling 135. Theory and practice in the description of grammatical systems. Comparison of approaches. Practical experience with data.

144. Field Methods in Linguistics (4) (Former Ling 139C)
Prerequisite: permission of instructor. Theory and practice in the collection and analysis of linguistic data.

145. Historical Linguistics (4)
Prerequisite: Ling 135. Explanation of similarities among languages; methods of reconstructing past languages and investigating relationship and grouping among languages. Inquires about the nature and types of linguistic change and their correlation with changes in culture.

147. Bilingualism (3)
An examination of psychological and sociological factors affecting individuals who attempt to function simultaneously in two different cultural environments, employing two separate linguistic codes. Review and comparison of past experience as well as current experimental programs in bilingual education.

190. Independent Study (1-3; max see reference)
See General Information Independent Study.

FOREIGN LANGUAGE COURSES

Chinese (Chin)

1A-B. Elementary Chinese (4-4) (1A. Former EXP 14)
Not open to students with previous training. Basic structure and pronunciation of Mandarin Chinese; practice in speaking, reading, and writing. (4 lecture, 1 lab hour)

2A-B. Intermediate Chinese (4-4)
Prerequisite: Chin 1B or equivalent. Review grammar and syntax; techniques of brush use; speaking and reading. (4 lecture, 1 lab hour)

Japanese (Japn)

1A-B. Elementary Japanese (4-4) (1A. Former EXP 15)
Beginning course in modern spoken and written Japanese. Covers learning comprehension and oral practice, basic grammar and sentence patterns. Introduction to reading and writing in Kana and Kanji characters. (4 lectures, 1 lab hour)

2A-B. Intermediate Japanese (4–4)
Prerequisite: Japn 1B or equivalent. Intermediate spoken and written Japanese; reading modern Japanese with emphasis on expository writings; translation and oral and written composition. (4 lecture, 1 lab hour)

GRADUATE COURSES (Ling)

(See *Course Numbering System—Definitions and Eligibility*)

200A-B. Graduate Survey (4–4)
Prerequisite: permission of instructor. Individually directed readings in linguistics and related subjects.

231. Seminar in Linguistics (3; max total 12 if no topic repeated)
Prerequisite: Ling 135 and permission of instructor. Topics to be offered at the discretion of the department: philosophy of language, psycholinguistics, dialectology, and other subjects in general linguistics.

232. Seminar in English Linguistics (3; max total 12 if no topic repeated)
Prerequisite: Ling 135 and permission of instructor. Topics to be offered at the discretion of the department: structure of Old, Middle, or Early Modern English; topics in English phonology, grammar, and lexicon.

290. Independent Study (1–3; max see reference)
See General Information—Independent Study.

299. Thesis or Project (2–5, max total 5)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

PHILOSOPHY DEPARTMENT

Professors: James Marvin Smith (Chairman), Colver, Pitt, Uphold, H. Walker
Associate Professor: H. Foster, Kessler
Assistant Professors: Gibson, Slinger
Lecturer: Hall
Part-time: Rosenthal

The Philosophy Department offers a highly flexible major which permits concentration in such areas as value theory, logic, religion, analysis, and the history of philosophy. Many students with majors in philosophy will enter college teaching; others will enter the fields of medicine, dentistry, law, social work, the ministry, or government.

PHILOSOPHY MAJOR

The major in philosophy consists of 28 units, with the following specific requirements:

	Units
(a) Phil 25 or 110	4
(b) Electives in history of philosophy, three courses, at least one in ancient philosophy and one in modern philosophy	9
(c) Electives in upper division problems of philosophy; at least one in the general area of metaphysics, epistemology or religion, and one in the general area of ethics, aesthetics, and political and social philosophy; at least one of these courses must be a seminar	12
(d) Independent study	3
	28

Note: Students intending to pursue graduate study in philosophy should seek the adviser's help in planning adequate preparation.

PHILOSOPHY MINOR

The minor in philosophy consists of 16 units in philosophy.

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see the sections on *Public School Credentials.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area III:* Phil 20T, 30 (3 units), 101, 102, 103, 104, 105, 106. *Area IV:* Phil 20T (1 unit), 25, 30 (1 unit). *Area V:* Phil 115T, 125T, 130T, 135T. (See *General Education—Courses*)

COURSES

PHILOSOPHY (Phil)

20T. Introductory Topics in Philosophy (4; max total 8 if no topic repeated)
(For composition requirements, equivalent to Engl 20.) Investigations into diverse problems of philosophy: ethics, religion, epistemology, social philosophy, metaphysics. Development of critical thinking and expression through individual projects and extensive writing under close supervision.

25. Methods of Reasoning (4)
Principles and methods of valid inference. Typical topics: forms of deductive inference, basic types of inductive inference, common pitfalls in moral reasoning, problems in reasoning due to the nature of language, and common fallacies found in arguments in everyday life.

30. Philosophical Reasoning (4)
Development of skill in assessing philosophical arguments by oral and written discussion of selected philosophical texts. Emphasis on the use of fundamental concepts of logic. Extensive writing and practice in logic.

101. Ancient Philosophy (3) (Former Phil 100T)
Consideration of the principal doctrines, schools and figures in Western Philosophy from Thales to the Stoics.

102. Medieval Philosophy (3) (Former Phil 100T)
Consideration of the principal doctrines, schools, and figures in Western Philosophy from Plotinus to Ockham.

103. Modern Philosophy (3) (Former Phil 100T)
Consideration of the principal doctrines, schools, and figures in Western Philosophy from Bacon to Kant.

104. Recent Philosophy (3) (Former Phil 100T)
Consideration of the principal doctrines, schools and figures in Western Philosophy from post-Kantians to Russell.

105. American Philosophy (3) (Former Phil 100T)
Consideration of the principal doctrines, schools, and figures in American Philosophy from Puritans to the present.

106T. Historical Issues (3; max total 9 if no topic repeated) (Former Phil 100T)
Consideration of special issues or individual philosophers from Plato to Russell.

107. Twentieth Century Philosophy (3)
Consideration of the principal doctrines, schools, and figures in England, the Continent, and the United States since 1900.

110. Symbolic Logic I (4)
Prerequisite: Math 75 or Phil 25 or permission of instructor. Rigorous development of deductions; sentential logic, a natural deduction system for the predicate logic; definition of systematic consistency and completeness, proofs of invalidity, consistency, and independence of sentences within predicate logic.

115T. Theory of Value and Obligation (3; max total 9 if no topic repeated) (Former Phil 150T)
Investigations of selected topics in ethics, aesthetics, political and social philosophy, philosophy of law.

116. History of Ethics (3)
Development of the main ethical doctrines of Western Philosophy from Socrates and the Sophists to Hegel and Mill.

120. Introduction to Philosophical Issues (3)
Not open to students with credit in Phil 20T. Prerequisite: junior standing. For students without philosophical background capable of benefiting from lectures on selected philosophical issues without extensive discussion or written work.

125T. Theory of Knowledge and Reality (3; max total 9 if no topic repeated) (Former Phil 150T)
Investigations of selected topics in metaphysics, epistemology, philosophy of language, and philosophy of science.

130T. Religious Studies (3; max total 9 if no topic repeated) (Former Phil 150T)
Investigations of selected topics in philosophy of religion, biblical studies, comparative religion, and theology. (Appropriate section same as Engl 115 and 116)

135T. Special Topics (3; max total 9 if no topic repeated) (Former Phil 150T)
Topics of current or interdisciplinary interest or requiring special background.

160T. Seminar in Historical Problems (4; max total 12 if no topic repeated)
Prerequisite: one upper division philosophy course, and one unit of independent study or permission of instructor. Intensive investigation of historical periods or figures with extensive writing and supervised research.

165T. Seminar in Metaphysics and Epistemology (4; max total 12 if no topic repeated)
Prerequisite: one upper division philosophy course, and one unit of independent study or permission of instructor. Intensive investigation of selected problems in perception, philosophy of mind, philosophy of science, and philosophy of language.

170T. Seminar in Moral and Political Theory (4; max total 12 if no topic repeated)
Prerequisite: one upper division philosophy course, and one unit of independent study or permission of instructor. Intensive investigation of problems in ethical reasoning, moral psychology, legal and political theory. Extensive writing and supervised research.

175T. Seminar in Religious Issues (4; max total 12 if no topic repeated)
Prerequisite: one upper division philosophy course, and one unit of independent study or permission of instructor. Intensive investigation of problems in philosophical theology, comparative religion, and culture. Extensive writing and supervised research.

180T. Seminar in Special Topics (4; max total 12 if no topic repeated)
Intensive investigation of topics of an interdisciplinary nature or those having special prerequisites.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

SCHOOL OF NATURAL SCIENCES

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GEOLOGY DEPARTMENT 245
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SCHOOL OF NATURAL SCIENCES

Burke Zane, Acting Dean

Department	*Chairman*
Biology	Keith M. Standing
Chemistry	Stephen A. Rodemeyer
Geology	Bruce A. Blackerby
Mathematics	Donald J. Donohue (acting)
Physics	Michael J. Zender
Psychology	Wayne B. Holder (acting)

The School of Natural Sciences provides for study in the disciplines of Biology, Chemistry, Geology, Mathematics, Physics, and Psychology.

Instruction in these disciplines is designed to accomplish either of two objectives. The first is to provide enough professional training, at either the undergraduate or graduate level, to serve as a foundation for a career in the discipline or for continued study at the graduate level in pursuit of advanced degrees. The second is to provide a means for all college students to gain an understanding of the world of science and to give students specific skills for use in related disciplines.

INTERDISCIPLINARY STUDY

The School also offers the opportunity for interdisciplinary science study in courses designed to meet student interest in such areas as environmental studies and ecology, science for public school teachers, and science for allied health professions.

NATURAL SCIENCE (N Sci)

140T. Topics in Natural Sciences (3; max total 12)

BIOLOGY DEPARTMENT

Professors: Standing (Chairman); Arce, Burdick, J. Carr, D. Falk, Hadsall, Hawbecker, Latimer, J. McClintic, Pigg, Rees, P. Smith, Staebler, Weiler, Woodwick

Associate Professors: T. Clark, Daubs, R. L. Evans, Haas, Harmon, Meyer, Spieler, Tribbey

Assistant Professors: Cheuk, L. Flake, Gherardini, Heckman, Mallory, Mangan, Moyle, Vidoli

Lecturer: McKernan

Part-time: G. E. Johnson, L. H. Smith

The Biology Department includes the following fields: biology, botany, entomology, microbiology, physiology, and zoology. Courses in each of these fields may be found under these headings. Courses are provided for general students, for those who are training for vocational and preprofessional work in biological fields, for students planning to become teachers, and for those who plan to enter the biological services of government agencies.

In addition to the general education offerings, the department offers majors and minors for the bachelor of arts degree; the bachelor of science degree; and master of arts degrees in biology and microbiology.

Five of the California State University and Colleges, including Fresno State, cooperate in the management of the Moss Landing Marine Laboratories on Monterey Bay, an establishment which offers regular course work and opportunities for research which are applicable to graduate and undergraduate programs. Consult the Biology Department. See *Special Programs—Moss Landing Marine Laboratories;* course descriptions follow Zoology courses.

PREPROFESSIONAL PREPARATION

For preprofessional program in dentistry, medicine, and pharmacy, see *Preprofessional Preparation.*

ADVANCED PLACEMENT

See *General Information—Advanced Placement*

FOREIGN LANGUAGE REQUIREMENT

One year of satisfactory collegiate study (or equivalent) in one foreign language is required for the bachelor of arts degree majors in biology, botany, microbiology, and zoology. See the general statement under *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

BACHELOR OF ARTS DEGREE MAJORS

The Biology Department offers majors for the bachelor of arts degree in biology, botany, microbiology, and zoology for students planning to enter graduate schools and research, professional schools, and biological field work. These majors consist of 32 to 40 units of which 24 must be upper division. Students must be reasonably prepared in physics, inorganic, and organic chemistry.

See bachelor of science degree in microbiology.

Biology Major for BA	*Units*
Bot 1 or equivalent	3–5
Zool 1 or equivalent	3–5
Biol 100, 120	6
Field course in biological science (see below)	3
Biological science electives (upper division; incl 7 units in botany and 7 units in zoology-entomology-physiology)	21–25
	40

Additional Requirements: Chem (including organic), Phys 1A, 2A or P Sci 10, statistics. See *Foreign Language Requirement.*

Approved Field Courses: Biol 112, 133, 208, Bot 106, 107, Ent 101, Zool 113, 114, 134, 135, 137, 138, 140, 165.

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Botany Major for BA

Bot 1	5
Biol 100, 120	6
Biological science electives	3
Botany electives (ud)	22
	36

Additional Requirements: Zool 1; Chem (incl organic) 8–9 units, plus a minimum of 10 units selected from the following: Phys 1A-B or 2A-B, Geol 109, statistics, or additional foreign language.

Microbiology Major for BA

Micro 104, 117, 118, 161, 185, 189	26
Biol 100, 120	6
	32

Additional Requirements: Bot 10 or 1; Zool 10 or 1; Chem 1A-B, 28, 104, 105, 109, 128; Phys 1A-B or 2A-B. See foreign language requirement.

Zoology Major for BA

Bot 1, Zool 1, 160, 164; Zool 114 or Ent 101	21
Biol 100, 120	6
Approved biological science electives (at least 6 units zoology-entomology-physiology)	9
	36

Additional Requirements: at least 8 units chemistry (incl organic), 6 units physics, 3 units statistics. See *Foreign language Requirement.*

BACHELOR OF SCIENCE DEGREE

The bachelor of science degree in microbiology is offered for students preparing for careers in laboratory technology, especially medical technology. This degree requires a total of 128 units. The general degree regulations and general education requirements must also be fulfilled.

Microbiology Major for BS

	Units
Micro 104, 117, 118, 150, 185	22
Biol 100	3
Phy 1	4
Zool 108, 158	8
	37

Additional Requirements: Bot 10, Zool 1, Chem 2A-B, 8, 104, 105, 109, 150, 151, 153, 154.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF ARTS DEGREE MAJORS

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15–17 units per semester. A total of 124 units must be completed for the bachelor of arts degree. Electives may include minor and credential requirements. (See *Degrees and Credentials.*)

Biology

1st Year: Chem 2A-B, Bot 1, F L
2nd Year: Chem 8, Phys 2A or 1A, Zool 1 (Recommended: Geol 1, Phys 2B)
3rd & 4th Years: Biol 100, 120, statistics; complete major requirements (Recommended: Chem 109)

Botany

1st Year: Bot 1, Zool 1, Chem 1A or 2A-B, F L
2nd Year: Phys 2A-B or 1A-B, Chem 8
3rd & 4th Years: Complete upper division botany courses, Biol 100, 120, biological science electives

Microbiology

1st Year: Bot 1 or 10, Chem 1A-B, F L
2nd Year: Micro 104, Chem 28, 109, 128, Phys 2A-B or 1A-B
3rd & 4th Years: Biol 100, 120, Micro 117, 118, 161, 185, 189, Chem 105, elective

Zoology

1st Year: Zool 1, Chem 1A or 2A-B
2nd Year: Bot 1, Phys 2A-B or 1A-B, Chem 8, Biol 120, F L
3rd & 4th Years: Major electives, Biol 100; Ent 101 or Zool 114, statistics, Zool 160, 164

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE MAJORS

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15–17 units per semester. A total of 128 units must be completed for the bachelor of science degree. (See *Degrees and Credentials.*)

Microbiology

1st Year: Zool 1, Bot 10, Chem 2A-B
2nd Year: Micro 104, Zool 108, Chem 8, 109, Phy 1
3rd & 4th Years: Micro 117, 118, 150, 185, Biol 100, Zool 158, Chem 105, 150, 151, 153

Biology Minor

The biology minor consists of 20 units of which 12 must be upper division.

	Units
Bot 10 and Zool 10 or equivalent	6–10
Biol 112 or an approved field course (see below)	3
Biol 120	3
Biology electives (6 units ud)	6–8
	20–22

Approved Field Courses: Biol 112, 133, 208, Bot 106, 107, Ent 101, Zool 113, 114, 134, 135, 137, 138, 140, 165.
Additional Requirements: P Sci 10 and Chem 2A or 1A

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREES

The Biology Department offers master of arts degrees in biology and microbiology.

Biology

The graduate program for the master of arts degree in biology is based on the equivalent of a Fresno State College undergraduate major in biology, botany, or zoology. Eighteen of the 30 units required for the degree must be in biological science. For specific requirements consult the department graduate adviser; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State College, see the *Graduate Bulletin,* available in the Office of the Dean, School of Graduate Studies.

Microbiology

The master of arts degree program in microbiology provides advanced educational opportunities for certain in-service people (e.g. medical technologists) as well as those newly completing the baccalaureate degree. The curriculum is also designed to meet the needs of those seeking the master of arts degree as a terminal graduate degree for professional advancement and those planning further education leading to the doctorate in bacteriology, microbiology, or molecular biology.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* Biol 10, 20, 120, Bot 1, 10, Phy 1, 22, 23, Zool 1, 10. (See *General Education—Courses.*)

COURSES

BIOLOGY (Biol)

10. Life Science (3) (Former Biol 2A)
Not open to students with credit in Bot 1 or Zool 1. Principles of biology related to the cell, maintenance, and relation of living organisms, heredity and elementary processes of evolution, and basic principles of ecology. (2 lecture, 2 lab hours)

20. Biology and Society (3) (Former 68/168)
Prerequisite: one college biology course. Impact of recent biological discoveries upon society, now and for the future; man's animal inheritance, human genetics, genetic engineering, organ transplants, and population problems.

100. Biological Systems (3)
Prerequisite: college botany and zoology or equivalent; organic chemistry recommended. Principles of bioenergetics, cybernetics and homeostasis at the cellular, organismic, and ecosystem level.

101. Nature Study (2)
Concurrently with Biol 102. Prerequisite: 9 units of natural science including a general biology, botany, or zoology course. Choice and development of natural science materials for elementary schools.

102. Nature Study Laboratory (1)
Concurrently with Biol 101. Problems and projects for elementary school. (3 lab or field hours)

112. Field Biology (3)
For biology minors only. Prerequisite: Bot 10, Zool 10 or equivalent. Local environmental and biotic interdependencies. (2 lecture, 3 lab or field hours *)

115. Symbiology (3)
Prerequisite: Biol 100 or permission of instructor. The biology of symbiotic associations. (2 lecture, 3 lab hours)

120. Genetics (3)
Prerequisite: college zoology or botany. Principles of biological inheritance, including gene structure, gene function, statistical methods, problem solving, and human genetics.

120L. Genetics Laboratory (2)
Prerequisite or concurrently: Biol 120. Experimental studies on inheritance in plants and animals, including man. (6 lab hours)

125. Organic Evolution (3)
Prerequisite: Biol 120 or equivalent. The study of evolutionary processes and patterns. (2 lecture, 1 discussion hour)

133. Aquatic Biology (4)
Prerequisite: Biol 100 or permission of instructor. Physical-chemical features of inland waters as related to their biology; community structure and function, ecological interactions, adaptations, and identification of aquatic organisms. (2 lecture, 6 lab or field hours, including weekend field trips *).

* Late afternoon, Saturday and/or overnight field trips may be required.

150. Electron Microscopy (4)
Prerequisite: permission of instructor. Preparation and examination of biological specimens. Basics of electron microscopy and interpretation of electronographs. (2 lecture, 6 lab hours)

157. Conservation of Natural Resources (3) (Same as E Ed 157)
Prerequisite: biological and physical science. Problems in conservation of natural resources in the United States; water supply, soils, minerals, metals, petroleum, natural gas, grasslands, forests, fisheries, wildlife, and recreational areas; local, state, and national plans and organizations for conservation; educational implications and techniques.

162. Biological Techniques (3)
For credential candidates only. Prerequisite: upper division in biology, permission of instructor. Collection and preparation of biological materials and specimens for instruction in secondary schools. (1 lecture, 6 lab hours)

173. Great Men of Science (2)
Prerequisite: college botany or zoology. Men from all fields of science and their contributions.

180. Cytology (4)
Prerequisite: college biology course and a physiology or chemistry course. Methods of cell research; cellular ultrastructure, cell function as an expression of structure. (3 lecture, 3 lab hours)

185T. Topics in Biology (1–4)
Prerequisite: permission of instructor. Investigation of selected areas in the field of biology.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (Biol)

(See *Course Numbering System—Definitions and Eligibility*)

200. Principles and Great Experiments in Biology (2)
Development and influence of current biological thought.

202. Cytogenetics (3)
Prerequisite: Biol 120. Seminars in structure, behavior, and function of chromosomes.

204. Biology of Speciation (2)
Prerequisite: major in the Biology Department, Biol 120, and an approved field course. Evolution as a process with emphasis on evolutionary mechanisms in plants.

206. Principles of Taxonomy (2)
Zoological nomenclature and related fields.

208. Field Work in Biology (1–6; max total 6)
Prerequisite: permission of instructor. Botanical and zoological field studies.*

220. Insect Toxicology (3)
Prerequisite: Ent 101, Chem 8. Mode of action of insecticides and other toxicants in insects and other animals; physical and chemical properties. (2 lecture, 3 lab hours)

225. Insect Taxonomy (2; max total 4)
Prerequisite: Ent 101, 115. Identification and classification of major and specific groups of family and generic status. (6 lab hours)

250. Scientific Research Reporting (2)
Prerequisite: permission of instructor. Techniques of scientific drawing and writing, illustrating emphasized. (1 lecture, 3 lab hours)

* Late afternoon, Saturday and/or overnight field trips may be required.

255T. Topics in Botany (2–3; max total 8)
Prerequisite: permission of instructor. Investigation of selected areas in the field of botany: basic metabolism, evolution of cultivated plants, instrumentation, plant ultrastructure, plant symbiotic association.

265T. Topics in Physiology (2–3; max total 8)
Prerequisite: permission of instructor. Investigation of selected areas in the field of physiology: endocrines, chemical physiology.

270T. Topics in Zoology (2–3; max total 8)
Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area: for example, protozoology, quantitative zoology, cytogenetics.

275. Zoogeography (3)
Prerequisite: Zool 113 or permission of instructor. Seminar in descriptive and ecological geography of animal groups, especially the vertebrates.

281T. Seminar in Biological Science (1; max total 5, max 2 in one field)
Prerequisite: permission of instructor. Reviews and reports on current literature in the various phases of biology.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299. Thesis (2–4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

302. Topics in Biology (3; max total 6)

BOTANY (Bot)

1. General Botany (5)
Students with credit in Bot 10 will receive only 2 units of credit. Prerequisite to most upper division botany courses. Fundamentals of structure and function in seed plants; survey of plant kingdom. (3 lecture, 6 lab hours)

10. Plant Biology (3) (Former Biol 1A)
Not open to students with credit in Bot 1. Structure, function, and development of plants, including topics in heredity, ecology, and evolution. (2 lecture, 2 lab hours)

104. Plant Physiology (4)
Prerequisite: college botany, Chem 1A or 2A–B. General metabolism and related processes. (2 lecture, 6 lab hours)

106. Plant Taxonomy (4)
Prerequisite: college botany. Principles of plant classification; local flora. (1 lecture, 9 lab or field hours *)

107. Plant Ecology (3)
Prerequisite: one year college biology. Interrelations of plants and environment. (2 lecture, 3 lab or field hours *)

116. Plant Microtechnique (3)
Not open to students with credit in Biol 116. Prerequisite: Bot 1 or 10 or the equivalent. Methods of preparing plant materials for microscopic examination, including tissue preparation, sectioning, staining, and photomicrography. (1 lecture, 6 lab hours)

134. Plant Anatomy (4)
Prerequisite: college botany. Initiation, development and structure of cells, tissues and tissue systems in roots, stems and leaves. (2 lecture, 6 lab hours)

135. Morphology of Non-vascular Plants (3)
Prerequisite: college botany. Comparative structure and phylogeny of the fungi, algae, mosses, and liverworts. (2 lecture, 3 lab hours)

136. Morphology of Vascular Plants (4)
Prerequisite: college botany. Comparative structure and phylogeny of ferns and seed plants. (2 lecture, 6 lab hours)

137. Plant Morphogenesis (4)
Prerequisite: Bot 1 or 10. Genetic, physiologic, and morphogenetic factors involved in the organization and development of plants. (2 lecture, 6 lab hours)

140. General Mycology (4)
Prerequisite: college botany or college microbiology. Structure, development, physiology, classification, and economic importance of representative genera and species of the fungi. (2 lecture, 6 lab hours, including field trips)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

200. Series. Graduate courses are listed under *Biology.*

ENTOMOLOGY (Ent)

101. General Entomology (3)
Prerequisite: college zoology or one year of biology. Anatomy, physiology, life history, and classification of insects and other arthropods. (2 lecture, 3 lab or field hours *)

106. Economic Entomology (3) (See Plant 121)

107. Medical Entomology (3)
Prerequisite: junior standing. Arthropod-borne diseases of man and animals and arthropod vectors of the diseases.

107L. Medical Entomology Laboratory (1)
Prerequisite or concurrently: Ent 107. (3 lab hours)

110. Insect Physiology (3)
Prerequisite: Ent 101. Principles of physiology as applied to insects; functions of insect body, tissues, and organs. (2 lecture, 3 lab or demonstration hours)

115. Insect Morphology (4)
Prerequisite: Ent 101. Comparative study of the form and structure of insects; external and internal anatomy. (2 lecture, 6 lab hours)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study*

200 Series. Graduate courses are listed under *Biology.*

MICROBIOLOGY (Micro)

20. Basics of Microbiology (2)
Not open to biology majors. Prerequisite: Chem 2A–B, Bot 1, 10, or Phy 1. Introduction to the organisms constituting the field of microbiology; principles and selected practical applications.

* Late afternoon, Saturday, and/or overnight field trips may be required.

21. Microbial Applications (3)
Not open to biology majors or to students with credit in Micro 20 prior to fall 1971. Prerequisite: Micro 20 or concurrent registration. Foundation principles. Specific microbial applications pertinent to the enrollees. (1 lecture, 6 lab hours)

101. Microbial Biospheres (4)
Recommended for biology majors. Prerequisite: Biol 100. Examination of interrelationships and characterization of microorganisms from natural and artificial environments. Uniculture and multiculture techniques emphasized. (2 lecture, 3 lab, 1 discussion hour)

104. Microbiology (5)
For majors. Prerequisite: organic chemistry; Bot 10 or 1. Morphological and physiological consideration of the Schizomycetes and selected unicellular Eumycetes; techniques, illustration of principles, and determinative bacteriology in the laboratory. (3 lecture, 6 lab hours)

117. Serology and Immunology (4)
Prerequisite: Micro 104, Chem 8. Principles and application of plasma changes in presence of antigens. (2 lecture, 6 lab hours)

118. Bacteriology of Human Disease (5)
Prerequisite: Micro 104, 117, Chem 8. Bacterial, etiological agents of human disease. (3 lecture, 6 lab hours)

150. Medical Mycology (4)
Prerequisite: Bot 10 or 1 and Micro 104 or 20. Morphology, physiology, and pathogenicity of mycotic agents of human and animal disease. (2 lecture, 6 lab hours)

161. Microbial Physiology (4)
Prerequisite: Micro 104, Chem 8. Structure and physiological functions in the microbial cell. (2 lecture, 6 lab hours)

185. Virology (4)
Prerequisite: permission of instructor. Biological and chemical aspects of viruses. Techniques of viral cultivation, detection, and assay; illustration of principles. (2 lecture, 6 lab hours)

189. Microbial Genetics (4)
Prerequisite: Biol 120. The nature of genetic information, its mutation, transfer, and recombination in microbial cells. (2 lecture hours, 6 lab hours)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (Micro)

(See *Course Numbering Systems—Definitions and Eligibility)*

256. Advanced General Microbiology (3)
Intensive study of microbial cell structures and their relationship to physiological activities of the cell; enrichment isolation procedures and physiological activities of selected bacterial species, including autotrophic and photosynthetic organisms. (2 lecture, 3 lab hours)

257. Immunochemistry (3)
Qualitative and quantitative consideration of the physical, chemical, and structural characteristics of antigens and antibodies and the dynamics of antigen-antibody reactions. (1 lecture, 6 lab hours)

258. Experimental Virology (3) (Former Biol 258)
Prerequisite: permission of instructor. Experimental procedures used in bacteriophage and animal virus research; collection, interpretation and presentation of data. (1 lecture, 6 lab hours)

259. Experimental Infectious Pathology (3) (Former Biol 259)
Prerequisite: permission of instructor. The production and study of tissue changes resulting from infection with pathogenic microorganisms. (1 lecture, 6 lab hours)

260T. Topics in Microbiology (2–3; max total 8) (Former Biol 260)
Prerequisite: permission of instructor. Intensive investigation of selected areas in microbiology.

281T. Seminar in Microbiology (1; max total 4 if no topic repeated)
Prerequisite: permission of instructor. Reviews and reports on current literature in the various phases of microbiology.

290. Independent Study (1–3; max total see reference)
See *General Information—Independent Study.*

299. Thesis (2–4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

PHYSIOLOGY (Phy)

1. Human Physiology (4)
Prerequisite: one year of college chemistry and a college biology course. Detailed study of the functions of the human body. (3 lecture, 3 lab hours.)

22. Human Anatomy and Physiology (4)
Not open to students with credit in Biol 66 or Phy 1. Anatomy and physiology of the cell, tissues, skeletal, muscular, nervous and circulatory systems. (3 lecture, 3 lab hours)

23. Human Anatomy and Physiology (4)
Prerequisite: Phy 22. Anatomy and physiology of respiratory, digestive, urinary, reproductive and endocrine systems, metabolism and special senses. (3 lecture, 3 lab hours)

140. Comparative Animal Physiology (4)
Prerequisite: one year of college chemistry, general zoology, or permission of instructor. Evolution of physiological systems; functional adaptations to different environments; physiological principles as applied to animals. (3 lecture, 3 lab hours)

155. Neuroanatomy (4)
Prerequisite: Phy 22 and 23, or Zool 164, or permission of instructor. Macroscopic and microscopic study of the structure and functional relationships of the mammalian nervous system. (3 lecture, 3 lab hours)

160. Neurophysiology (4)
Prerequisite: Phy 1 or 22 and 23, or permission of instructor. Advanced regulatory physiology of the central and peripheral nervous systems including modern developments in neuron physiology and function. (3 lecture, 3 lab hours)

170. Cell Physiology (4)
Prerequisite: Organic chemistry. Methods, structural bases, cytoplasmic organoids, molecular components, metabolism. (3 lecture, 3 lab hours)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

200 Series. Graduate courses are listed under *Biology.*

ZOOLOGY (Zool)

1. General Zoology (5)
Students with credit in Zool 10 will receive only 2 units of credit. Prerequisite to most upper division courses in zoology. Survey of major phyla and principles of animal biology. (3 lecture, 6 lab hours)

10. Animal Biology (3) (Former Biol 1B)
Not open to students with credit in Zool 1. Structural and functional comparison of animals; principals and human implications of inheritance, evolution, and ecology; physiology as applied to man. (2 lecture, 2 lab hours)

103. Vertebrate Zoology (3)
Not open to students with credit in Zool 164. Prerequisite: college zoology. Study of the vertebrates with emphasis on evolution, structure, and physiology. (2 lecture, 3 lab hours)

108. Parasitology (4)
Prerequisite: college zoology, Chem 1A or 2A-B. Biology of parasites living in human beings. (2 lecture, 6 lab hours)

113. Natural History of Vertebrates (4)
Prerequisite: college zoology. Vertebrate classes; natural history of local species. (3 lecture, 3 lab or field hours *)

114. Invertebrate Zoology (3)
Prerequisite: college zoology. Invertebrates exclusive of insects, parasitic protozoa and helminths. (2 lecture, 3 lab or field hours *)

115. Protozoology (3)
Prerequisite: Biol 100 or permission of instructor. The biology of protozoan organisms. (2 lecture, 3 lab hours)

116. Zoological Microtechnique (3)
Not open to students with credit in Biol 116. Prerequisite: college zoology or equivalent. Methods of preparing zoological materials for microscopic examination, including tissue preparation, sectioning, staining, and photomicrography. (1 lecture, 6 lab hours)

130. Animal Behavior (3)
Prerequisite: college zoology or permission of instructor; recommended, one course in ecology or natural history. Principles of ethology with emphasis on mechanisms of behavior. (2 lecture, 3 lab hours *)

134. Wildlife Management (3)
Prerequisite: Zool 103 or 113 or permission of instructor. Relation of vertebrates to human affairs. (2 lecture, 3 lab or field hours *)

135. Mammalogy (3)
Prerequisite: Zool 103 or 113 or permission of instructor. Mammals of the world with emphasis on local species. (2 lecture, 3 lab or field hours *)

137. Herpetology (3)
Prerequisite: Zool 103 or 113 or permission of instructor. Reptiles and amphibians of the world with emphasis on local species. (2 lecture, 3 lab or field hours *)

138. Animal Ecology (3)
Prerequisite: college biology, including zoology; or permission of instructor. Environmental relationships of local vertebrates. (2 lecture, 3 lab or field hours *)

140. Ichthyology (3)
Prerequisite: Zool 103 or 113 or permission of instructor. Fishes of the world with emphasis on California fishes, freshwater and marine. (2 lecture, 3 lab or field hours *)

144. Diseases of Fishes (4)
Prerequisite: Zool 1 or 10 or permission of instructor; ichthyology recommended. Biology of fish pathogens; symbionts. (2 lecture, 6 lab hours *)

157. Histology (4)
Prerequisite: college zoology. Identification and study of vertebrate cells, tissues, and organs. (2 lecture, 6 lab hours)

* Late afternoon, Saturday and/or overnight field trips may be required.

158. Hematology (4)
Prerequisite: Phy 1 or Zool 157. Development, structure, function, and identification of the cellular elements of blood and of those plasma constituents involved in blood clotting. (2 lecture, 6 lab hours)

160. Comparative Embryology of Vertebrates (4)
Prerequisite: college zoology. Principles of development in amphioxus, frog, chick, pig, human. (2 lecture, 6 lab hours)

164. Comparative Anatomy of Vertebrates (4)
Prerequisite: college zoology. Comparison of structures in selected vertebrates. (2 lecture, 6 lab hours)

165. Ornithology (3)
Prerequisite: Zool 103 or 113 or permission of instructor. Introduction to the identification and natural history of birds with emphasis on local species. (2 lecture, 3 lab or field hours *)

175. Vertebrate Evolution (3)
Prerequisite: Biol 120; Zool 103 or 113 or permission of instructor. The course of evolution of the higher vetebrates including present concepts of speciation.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

200 series. Graduate courses are listed under *Biology.*

MOSS LANDING LABORATORIES

MOSS LANDING (M Sci)

Note: The following courses are offered at the Moss Landing Marine Laboratories. See Special Programs—Moss Landing Laboratories; see also Geol 109. M Sci 101 and 161 must be accompanied by M Sci 102, Marine Science Techniques. All full-time students new to MLML must be enrolled in M Sci 102 and either 181 or 285. M Sci 101 is strongly recommended.

101. General Oceanography (4)
Prerequisite: college chemistry and biology. An interdisciplinary examination of physical and chemical characteristics of seawater, distribution and effects of ocean currents, geology of the ocean floor and relations of organisms to the marine environment. (3 lecture, 3 lab or field hours)

102. Marine Science Techniques (3) (Former M L 185.5)
Prerequisite: college chemistry and algebra. Introductory field and laboratory practice in the use of instruments for collection, analysis, and interpretation of data on the marine environment. (2 lecture, 3 lab hours)

111. Zoology of Marine Vertebrates (4)
Prerequisite: college zoology or equivalent. Field-oriented study of the natural history, ethology, physiology, identification, and systematics of vertebrates living in or associated with marine, estuarine, and shore communities; interrelationships among organisms within these environments. (2 lecture, 6 lab or field hours)

121. Marine Invertebrate Zoology (4)
Prerequisite: college zoology or equivalent. Field-oriented study of adaptations and responses of invertebrate animals to their marine and estuarine habitats; interrelationships or organisms within these environments. Emphasis on field observation, collection, identification, and systematics. (2 lecture, 6 lab or field hours)

* Late afternoon Saturday and/or overnight field trips may be required.

131. Marine Algology (4)
Prerequisite: college botany or equivalent. Field-oriented study of the ecological associations, physiology, identification, and systematics of marine and estuarine algae, with emphasis upon community relationships. (2 lecture, 6 lab or field hours)

133. Micropaleontology (3)
Prerequisite: college general geology or zoology. Fossil micro-organisms: stratigraphic and environmental significance of foraminifera. (2 lecture, 3 lab hours)

135. Marine Metereology (3) (Former M L 185.3)
Prerequisite: college mathematics. Introductory descriptive course in physical processes involved in wind-generated surface waves, currents, temperature structure, and near shore zones of the oceans. (2 lecture, 3 lab or field hours)

136. Physical and Chemical Oceanography (3) (Former M L 185.7)
Prerequisite: differential calculus and college chemistry or permission of instructor. Quantitative description of the distributions of properties (salinity, temperature, dissolved oxygen, etc.) in the oceans and the relation between these distributions and the physical and biochemical processes. (2 lecture, 3 lab and field hours)

137. Marine Biogenic Sediments (3) (Former M L 185.2)
Prerequisite: M Sci 101 or equivalent and college geology and biology. Interdisciplinary studies of provenance, geologic, and biologic composition of sediments and of contributing organisms; emphasis on microorganisms and hard remains. (2 lecture, 3 lab or field hours)

141. Geological Oceanography (3)
Prerequisite or concurrent: M Sci 101 and 102. Structures, physiography, and sediments of the sea bottom and shoreline. (2 lecture, 3 lab or field hours)

153. Marine Science Diving (2) (Former M L 185.4)
Prerequisite: upper division science major; ability to pass swimming test. Skin and SCUBA diving course; five ocean dives include underwater sampling and survey techniques. Successful completion gives NAUI and MLML certification. (1½ lecture, 2½ pool and ocean hours, and 5 Saturdays)

161. Marine Ecology (4)
Prerequisite: basic ecology, college mathematics and chemistry. Field-oriented exploration of the physical parameters of marine estuarine and freshwater environments, with emphasis upon ecological and physiological responses of plants and animals to limiting factors of these environments. (2 lecture, 6 lab or field hours)

180. Special Problems in the Marine Sciences (1–4)
Prerequisite: consent of instructor. Open only to undergraduate students having adequate subject matter preparation for the selected problem. Faculty directed study of selected research problems in the marine sciences. (3 conference, lab, or field hours per unit)

181. Literature of the Marine Sciences (1)
Prerequisite: college chemistry and biology. Directed studies of selected works from the pertinent literature as basis for colloquium and seminar presentations and discussions.

185T. Topics in Marine Science (1–6)
Topics in botany, zoology, chemistry, geography, geology, and other associated areas of the marine sciences: ichthyology, behavior of marine animals, chemical oceanography, physical oceanography, meteorology of the oceans.

GRADUATE COURSES (M Sci)

(See *Course Numbering System—Definitions and Eligibility*)

262. Advanced Marine Ecology (3)
Prerequisite: ecology and/or permission of instructor. Advanced considerations of marine populations, communities and ecosystems with emphasis on current literature. (2 lecture, 3 lab, field, or discussion hours)

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277. Human Ecology of Monterey Bay (3)
Investigation and analysis of changes produced by human impacts on the coastal environment with emphasis upon physiographic alterations and ecological implications. (2 lecture, 3 field hours)

282. Seminar in the Marine Sciences (2)
Prerequisite: graduate standing. Reviews and reports on recent literature and problems in marine science.

283. Advanced Studies in the Marine Sciences (3) (Former ML 281)
Prerequisite: graduate standing. Studies of the historic roots of the marine sciences and evolution of major principles and concepts; analyses of selected researches from recent scientific literature, experience with problem-solving approaches to marine science studies.

285T. Advanced Topics in Marine Sciences (1–6)
Prerequisite: graduate standing. Advanced topics in marine science (botany, zoology, chemistry, geography, geology, and other associated areas of the marine sciences).

298. Research in the Marine Sciences (1–4)
Prerequisite: consent of instructor. Independent investigations of an advanced character for the graduate student with adequate preparation. (3 conference, lab, and field hours per unit)

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CHEMISTRY DEPARTMENT

Professors: Biggerstaff, Bluestone, Bremner, Burtner, Ciula, D. Clark, Kallo, Kauffman, W. Miller

Associate Professors: Rodemeyer (Chairman), Gigliotti, B. Gump, Kunimitsu, Russell, Vavoulis

Assistant Professors: Frank, Marhenke, Toney, Zellmer, Ziegler

Lecturer: Tabakian

Part-time: Braun, C. Brooks, N. Gump, Koligian, Tartarian

The Chemistry Department provides (1) undergraduate training in chemistry for students planning professional careers in chemistry and allied professions, and for those contemplating graduate work for advanced degrees; (2) participation in the preparation of teachers of chemistry and the other physical sciences in the teaching credential programs; (3) teaching of the basic chemical sciences required by students majoring in related fields such as physics, biology, nursing, engineering, geology, agriculture, home economics, and criminology; (4) stimulation of interest in and understanding of the achievements and contributions of chemistry to our civilization for non-science students, as a part of general education; and (5) graduate instruction in chemistry for the master of science degree for students who intend to enter the chemical industry, pursue further advanced study, or who wish to improve their qualifications as teachers in secondary schools and junior colleges.

The bachelor of science degree program in chemistry is approved by the American Chemical Society. Students who satisfactorily complete the program will be recommended by the department for certification as graduate chemists by the American Chemical Society. Students completing the bachelor of arts degree may be recommended for certification by completing additional requirements of the American Chemical Society.

Five of the California State University and Colleges, including Fresno State, cooperate in the management of the Moss Landing Marine Laboratories on Monterey Bay, an establishment which offers regular course work and opportunities for research which are applicable to graduate and undergraduate programs. Consult the chairmen of the Biology, Chemistry, and Geology Departments. See *Special Programs—Moss Landing Marine Laboratories;* for course descriptions see *Biology Department.*

HIGH SCHOOL PREPARATION

The high school preparation for majors in the chemistry department should include: algebra (2 years), plane and solid geometry, trigonometry; chemistry or physics; German (2 years).

Prospective students may elect to take the general chemistry placement test at college entrance. A satisfactory score in this test will permit the student to start the chemistry course sequence with Chem 1B or 4B.

MAJORS

For the bachelor of arts degree a major in chemistry consists of 35 to 38 units as listed below. For the bachelor of science degree, a major in chemistry consists of 48 to 51 units as listed below. Upper division students having a grade average of B or higher in their major courses are encouraged to elect Chem 190, Independent Study, in order to acquire first-hand experience in a research project.

Foreign Language Requirement

German 1A-B or equivalent is required for bachelor of science degree majors in chemistry. See the general statement under *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

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BACHELOR OF ARTS DEGREE IN CHEMISTRY

	Units
General Education	40
Chemistry Major	35–38
Chem 1A-B or 4A-B, 28, 29, 102, 106, 110A-B, 111, 128, 129	
Additional Requirements	20
Math 75, 76, 77, Phys 2A-B	
Electives (See *Note* below)	26–29
Recommended: Chem 99	
	124

Note: A student may orient his baccalaureate degree program in one of several directions by the proper selection of elective courses, as follows.

Biochemistry: Chem 155, 156; two biological science electives from Phy 1, Micro 104, Biol 120

Clinical Chemistry: Chem 153, 154, 155, 156; Micro 104

Agricultural Chemistry: Chem 155, 156; 9 units of approved electives in animal or plant science

Secondary Education: Chem 99, 123, 160

Spectroscopy: Chem 115, 190 (6 units)

Physical Measurements: Chem 126, 190 (6 units)

Additional programs may be constructed upon consultation with a departmental adviser.

BACHELOR OF SCIENCE DEGREE IN CHEMISTRY

General Education	40
Chemistry Major	48–51
Chem 1A-B or 4A-B, 28, 29, 102, 106, 110A-B, 111, 123, 124, 128, 129, 155	
Elect 6 units from Chem 115, 126, 130, 156, 190, or one additional approved physics or mathematics course (recommended: Phys 102, 110, 120, Math 81, 171)	
Additional Requirements	24
Math 75, 76, 77, Phys 4A-B-C	
Electives	13–16
Germ 1A-B or equivalent required if not taken in high school	
	128

MINOR

A minor in chemistry for a bachelor's degree requires 20–22 units, of which 8 are upper division.

Chem 1A-B or 4A-B; or 2A-B and 101; or 2A-B and 150, 151	7–11
Chem 8, 104, 105, 109	11
	18–22

CREDENTIAL PROGRAM

For information on the current credential program consult departmental advisers and the School of Education; see the sections on *Public School Credentials.*

MASTER OF SCIENCE DEGREE

The graduate program for the master of science degree in chemistry is based on the equivalent of the undergraduate major at Fresno State. Twenty of the 30 units required for the degree must be in chemistry. For specific requirements, consult the chairman of the department; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the Dean, School of Graduate Studies.

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FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of science degree with a major in chemistry (except for those who have been certified as graduates in Chemistry by the American Chemical Society) requires the passing of an examination demonstrating the ability to read scientific German or Russian.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* Chem 1, 1A-B, 2A-B-C, 4A, 4B, 8. (See *General Education—Courses*)

COURSES

CHEMISTRY (Chem)

1. Introduction to Science and Ideas (3) (Former P Sci 12)
Not open to students with credit in college chemistry; for nonscience majors. Prerequisite: one year of high school algebra or equivalent. Qualitative introduction to principles and theories of chemistry and related physical sciences. Reading assignments dealing with history and philosophy of science, the interaction of science and society, and the nature of the scientific enterprise. (3 lecture-demonstration hours)

1A-B. General Chemistry and Qualitative Analysis (5–5)
Chem 1A not open to students with credit in Chem 2A-B. Prerequisite: high school chemistry or physics; advanced algebra or Math 29. Fundamental principles of chemistry; properties of common elements and their compounds; application of the principles of chemical equilibrium to separation and identification of ions. (3 lecture, 6 lab hours)

2A-B. Introductory General Chemistry (3–3)
Prerequisite: high school algebra, plane geometry. Composition of matter and physical and chemical changes; fundamental laws and principles; atomic and molecular structure, qualitative and quantitative techniques; introduction to organic chemistry and biochemistry. (2 lecture, 3 lab hours)

2C. Introduction to Organic and Biological Chemistry (4)
Primarily for students in the health-oriented professions; not a substitute for chem 8. Prerequisite: Chem 2A. Introduction to the basic concepts of organic and biological chemistry. Structure and behavior of organic and biochemical compounds, metabolism, and regulation. (3 lecture, 3 lab hours)

4A. General Chemistry (4)
Not open to students with credit in Chem 1A or 2A-B. For chemistry majors and premedical students. Prerequisite: high school chemistry, advanced algebra, or Math 29. Stoichiometry, solutions, ionic equilibrium, gases, atomic structure and bonding, liquids and solids. (3 lecture, 3 lab hours)

4B. Introduction to Inorganic Chemistry (3)
Prerequisite: Chem 4A, 1A or permission of instructor. Introduction to bonding, reactions and structure of inorganic and coordination compounds. Preparation and characterization of simple inorganic compounds. (2 lecture, 3 lab hours)

8. Elementary Organic Chemistry (3)
Not open to chemistry majors. Recommended for students requiring a one-semester course in the field. Prerequisite: Chem 1A or 2A-B or 4A-B. Lectures, discussions, and demonstrations of fundamental principles; structure and chemical behavior of organic compounds.

28. Introductory Organic Chemistry (3)
For chemistry majors; recommended for premedical students and other science majors. Not open to students with credit in Chem 8. (Chem 28 and 128 together constitute a year sequence.) Prerequisite: Chem 1A-B or Chem 2A-B or 4A-B. Introductory survey of the reactions of principal functional groups.

29. Introductory Organic Chemistry Laboratory (2)
Chem 29 and 129 together constitute a year sequence. Prerequisite or concurrently: Chem 28. Laboratory study of properties and reactions of organic compounds and synthesis of representative compounds. (6 lab hours)

99. Glass Blowing (1)
Enrollment limited with preference to junior and senior chemistry majors. Elements of glass blowing; construction and repair of glass apparatus. (3 lab hours)

101. Introductory Physical Chemistry (3)
Not open to chemistry majors. Prerequisite: logarithms, elementary algebra; organic chemistry, quantitative analysis. Kinetic theory of gasses, liquids, solutions, buffers, conductance, electromotive force cells, reaction kinetics, colloidal systems, radioactivity, nuclear fission. (3 lecture-demonstration hours)

102. Quantitative and Qualitative Analysis (5) (Former Chem 6)
For chemistry majors; recommended for other science majors and premedical students; not open to students with credit in Chem 104-105. Prerequisite: Chem 28. Introductory principles and methods of quantitative and qualitative analysis. (3 lecture, 6 lab hours)

104. Quantitative Analysis (2)
Prerequisite: Chem 1B or 4B or 2B. Application of chemical and mathematical principles to the quantitative analysis of inorganic and organic substances.

105. Quantitative Analysis Laboratory (3)
Not open to chemistry majors. Prerequisite: Chem 104 (or concurrent). Laboratory study of principles and methods of quantitative analysis. (1 lecture, 6 lab hours)

106. Analytical Chemistry (4)
Prerequisite: Chem 102, 110A, 110B and 111 (or concurrently). Principles and methods of qualitative and quantitative analysis of inorganic and organic substances, including an introduction to instrumental analysis. (2 lecture, 6 lab hours)

107. Introduction to Radiochemistry (3)
Prerequisite: Phys 2B, Chem 8, 102, or 105. To introduce students in the physical and biological sciences to applications of radioisotopes, nuclear methods of analysis, and radiation safety. (3 lecture-demonstration hours)

109. Elementary Organic Chemistry Laboratory (3)
Not open to chemistry majors. Prerequisite or concurrently; Chem 8 or 28. Laboratory study of the carbon compounds with coordinating lectures. (1 lecture, 6 lab hours)

110A-B. Physical Chemistry (3–3)
Prerequisite: Chem 1B, 8 or 28; Phys 4A and B, or 2A-B; Math 77. Mathematical treatment of the laws of thermodynamics, reaction kinetics, elementary statistical and quantum mechanics, properties of solutions, kinetic theory of gases, crystal structure, molecular structure, and nuclear chemistry.

111. Physical Chemistry Laboratory (3) (Former Chem 111 A-B)
Prerequisite: Chem 110B (or concurrently), Chem 102 or 105. Techniques of physical measurements, error analysis and statistics; ultraviolet, infrared and nuclear magnetic resonance spectroscopy; dipole moments, viscosity, calorimetry, Kinetics, phase diagrams, thermodynamic measurements, and report writing. (1 lecture, 6 lab hours)

115. Quantum Mechanics in Chemistry (3)
Prerequisite: Chem 110A-B. Classical mechanics and vectors; postulates of quantum mechanics, square well, harmonic oscillators, rotor and hydrogen atom problems; approximation techniques; chemical bonding and spectroscopy.

123. Intermediate Inorganic Chemistry (2)
Prerequisite: Chem 1B or 4B, 102, 28 and 110A (or concurrently). Nonmathematical treatment of ionic and covalent bonding, elementary atomic structure, molecular structure, reaction mechanisms, and coordination chemistry. (2 lecture-demonstration hours)

124. Synthesis and Characterization (2)
Prerequisite: Chem 123 (or concurrently). Techniques of preparation to include high temperature reactions, vacuum line and glove box preps, nonaqueous syntheses, solid state reactions. Emphasis on structural characterizations using instrumental methods. (1 lecture, 3 lab hours)

125. Introductory Instrumental Analysis (3)
Not open to chemistry majors. Prerequisite: Chem 8, 105; Phys 2A-B (or permission of instructor). Lecture and laboratory study of instrumental methods of analysis of organic and inorganic substances. Elements of instrument design. (2 lecture, 3 lab hours)

126. Instrumental Methods of Analysis (3)
Prerequisite: Chem 102, 110A (or concurrently). Physical and instrumental methods of analysis of inorganic and organic substances; instrumental design. (1 lecture, 6 lab hours)

128. Intermediate Organic Chemistry (3)
Prerequisite: Chem 28 or 8. Continuation of Chem 28. A thorough study of the reactions of aliphatic and aromatic compounds of carbon with emphasis on theory and mechanism.

129. Intermediate Organic Chemistry Laboratory (2)
Prerequisite: Chem 29 or 109. Continuation of Chem 29 with emphasis on more difficult laboratory techniques and syntheses; introduction to qualitative organic analysis. (6 lab hours)

130. Organic Analysis (3)
Prerequisite: Chem 102, 128, 129. Characterization of organic compounds through study of chemical and physical properties; application of spectroscopy, chromatography and functional group analysis to elucidation of structure. (1 lecture, 6 lab hours)

140T. Topics in Chemistry (1–3; max total 6 if no area repeated)
Prerequisite: permission of instructor. Seminar covering special topics in one of the areas of chemistry: analytical, biochemistry, inorganic, organic, physical.

150. General Biochemistry (3)
Prerequisite: Chem 8, 105, 109. Chemistry and metabolism of basic cellular constituents including carbohydrates, lipids, proteins, and nucleic acids.

151. General Biochemistry Laboratory (2)
Prerequisite or concurrently: Chem 150. Chemical and physical properties of naturally occurring compounds; introduction to techniques of chromatography, polarimetry, electrophoresis, photometry, and enzymology. (6 lab hours)

153. Physiological Chemistry (2) (Former Chem 152)
Prerequisite: Chem 151. Intensive discussion of mammalian physiological biochemistry under normal and various pathological states.

154. Clinical Biochemistry Laboratory (3) (Former Chem 152)
Prerequisite: Chem 153 (or concurrently). Clinical laboratory methods of analysis of tissues and body fluids and their diagnostic value; emphasis on instrumental methods. (1 lecture, 6 lab hours)

155. Fundamentals of Biochemistry (3)
Primarily for chemistry majors; recommended for premedical students and graduate students in the sciences. Prerequisite: Chem 102 or 105, 128, 129. Structure, function, and metabolism of chemical entities in living systems.

156. Biochemical Laboratory Techniques (3)
Prerequisite: Chem 155, 129 (or concurrently), or permission of instructor. Laboratory study of the chemical and physical properties of naturally occurring compounds; metabolism of living systems; application of techniques in chromatography, electrophoresis, spectrophotometry, enzymology, and radioisotopes. (1 lecture, 6 lab hours)

160. History of Chemistry (2)
Prerequisite: chemistry minor or equivalent and Chem 1A-B or 101. Seminar in the evolution and development of chemistry, both in theory and practice, from ancient times to the present. Critical study of fundamental contributions of outstanding chemists.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Introduction to Chemical Research (3)
Prerequisite: graduate standing. Principles and practice of chemical research with emphasis on laboratory techniques. (9 laboratory-demonstration hours)

211. Chemical Thermodynamics (3)
Prerequisite: Chem 110A-B, 111. Principles of thermodynamics; application to chemical problems; introduction to statistical methods, calculation of thermodynamic functions from spectroscopic data.

215. Quantum Chemistry (3)
Prerequisite: graduate standing. Seminar on recent advances in quantum mechanics; chemical bonding, and atomic and molecular spectroscopy.

220. Theoretical Inorganic Chemistry (3)
Prerequisite: Chem 110A-B. Seminar on theoretical inorganic chemistry emphasizing structure and bonding of inorganic and coordination compounds; valence bond, molecular orbital and ligand field theories; correlation of structure and reactivity.

225. Separation Methods in Chemistry (3)
Prerequisite: Chem 106, 110A-B, 128, 129. Seminar and laboratory on the theory, application, and literature of various separation methods for organic and inorganic analysis. (2 lecture, 3 lab hours)

226. Advanced Analytical Chemistry (3)
Prerequisite: Chem 106, 110A-B, 111. Theory, application, recent developments and literature of organic and inorganic analysis.

230. Advanced Organic Chemistry (3)
Prerequisite: Chem 128, 129. Seminar on recent advances in organic chemistry including reaction mechanisms and synthetic applications with references to current literature.

235. Physical Organic Chemistry (3)
Prerequisite: Chem 110A-B, 128. Seminar in applications of modern theoretical concepts to the chemical and physical properties of organic compounds.

240T. Topics in Advanced Chemistry (1–3; max total 6 if no area repeated)
Seminar covering special topics in one of the areas of chemistry: analytical, biochemistry, inorganic, organic, physical.

255. Advanced Biochemistry (3)
For graduate students in chemistry and biology. Prerequisite: Chem 128 (or concurrently). Seminars on the chemical factors underlying life processes, including the chemistry, function, and metabolism of major cellular constituents; enzymatic catalysis; energy metabolism and the control of metabolic processes.

258. Seminar in Biochemistry (3)
Prerequisite: Chem 155 or 255; or permission of instructor. Seminar in selected biochemical topics with reference to the current literature.

280. Seminar in Chemistry (1; max total 2)

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

298. Research (2–6; max total 6)

Prerequisite: permission of instructor. Independent investigations of an advanced character for the graduate student with adequate preparation. (May include conferences, laboratory, library.)

299. Thesis (4)

Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

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GEOLOGY DEPARTMENT

Professors: Blackerby (Chairman), Cserna, Mack
Associate Professors: Avent, Lange, White
Assistant Professors: Bereskin, Merrill, Nokleberg
Part-time: Cehrs, Gustafson

The Geology Department offers a major in geology for the bachelor of arts degree. Geology offerings include undergraduate preparation for professional careers and for graduate work. The department offers courses for earth study as an avocation. The graduate program provides (1) courses of instruction and research leading to a master of arts degree, (2) graduate-level courses for students from other departments, particularly those undertaking work at Moss Landing Marine Laboratories, and (3) advanced course work for professional personnel within the Fresno State service area.

Five of the California State University and Colleges, including Fresno State, cooperate in the management of the Moss Landing Marine Laboratories on Monterey Bay, an establishment which offers regular course work and opportunities for research which are applicable to graduate and undergraduate programs, including courses in geological oceanography. Consult the chairman of the Geology and Biology Departments. See *Special Programs—Moss Landing Laboratories;* for course descriptions see *Biology Department.*

BACHELOR OF ARTS DEGREE

The bachelor of arts degree with a major in geology consists of a total of 124 units including 40 units of geology. For general degree requirements see *Degrees and Credentials.* A student planning graduate study is advised to meet the foreign language requirements of the institution he plans to attend. Students majoring in geology are strongly urged to take Geology 107 and make arrangements for Geology 108A-B during their junior year (see adviser).

GEOLOGY MAJOR

	Units
Geol 1 and 1L or 10, 2, 12, 13, 100, 101, 104, 106, 107, 108A-B	30
Elect from upper division geology (See *Note* below)	10
	40

Note: Recommended elective curriculum

Group A: Geol 105, 110, 120, 122. Select at least 1 course for 3–5 units.
Group B: Geol 122, 171. If possible, select 1 course for 3–5 units.
Group C: Geol 115, 116, 117, 125. Select at least 1 course for 2–3 units.
Group D: Geol 109, 112, 118, 130T, 189, 189L. Selection based on completion of 10-unit elective requirement and strength in field of interest.

Additional Requirements: Zool 10; Chem 1A-B; Math 75, 76, or Math 71, 72, 76; Phys 2A-B. Recommended: At least two years of French, German, or Russian and Geol 124 in preparation for graduate study.

GEOLOGY MINOR

A minor in geology consists of 20 units. The following courses are recommended: Geol 1 and 1L or 10, 2, 3, 12, 101, 105, 189, and 189L.

CREDENTIAL PROGRAM

For information on the current credential program consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in geology is based on the equivalent of the undergraduate major at Fresno State. Twenty of the 30 units required for the degree must be in geology. For specific requirements consult the chairman of the department; for general requirements see School of Graduate Studies. For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

1105 1 2 11 405

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* Geol 1, 1L, 2, 10, 12, 189, 189L. (See *General Education—Courses.*)

COURSES

GEOLOGY (Geol)

1. Physical Geology (3)
Nature and properties of earth materials and processes involved in development of landscapes; work and effects of streams, waves, glaciers, volcanoes, mountain building, and earthquakes. May include field trips.

1L. Physical Geology Laboratory (1)
Prerequisite: Geol 1 concurrently or permission of instructor. Introductory laboratory study of minerals, rocks, topographic maps, and geologic maps; land forms and geologic structures as shown by maps and models. One-day field trips may be required. (3 lab hours)

2. Historical Geology (3)
Prerequisite: Geol 1 or equivalent. Survey of earth's history revealed by the rock sequence. May include field trips.

2L Historical Geology Laboratory (1)
Prerequisite: Geol 1, 2 (concurrently) or permission of instructor. Introductory laboratory study of geologic time, geologic maps, regional geology and regional geologic history. (3 lab hours)

3. Field Studies (1)
Prerequisite: Geol 1 (concurrently) or permission of instructor. Weekend supervised field trips to areas such as Yosemite, Sequoia, Death Valley, San Joaquin Valley and the Coast Ranges.

10. Introduction to Geoscience (4)
Not open to students with credit in Geol 1 and 1L. Recommended for science and engineering majors. Detailed introduction to earth sciences, including earth materials and properties of soil and rock, surface processes, structural geology subsurface water, map and photo interpretation. Includes field trips. (3 lecture-discussion and 3 lab hours)

12. Mineralogy (3) (Former Geol 12A)
Geology majors must take Geol 13 concurrently. Prerequisite: high school chemistry. Properties, relationships, origin of minerals; determination of common minerals by chemical tests. May include field trips. (2 lecture, 3 lab hours)

13. Crystallography (1) (Former Geol 12B)
Prerequisite: high school chemistry, trigonometry. Form and structure of crystals. (3 lab hours)

100. Optical Mineralogy (3) (Former Geol 170)
Prerequisite: Geol 13 or permission of instructor. Optical properties of minerals; identification of selected minerals by optical methods. Manipulation and use of petrographic microscope. (2 lecture, 3 lab hours)

101. Petrology (3)
Prerequisite: Geol 1, 12, 13, 100 (or concurrently with permission of instructor). Common rock-forming minerals; origin, classification, textures, and structures of igneous, sedimentary, and metamorphic rocks; examination of rocks in hand specimen and thin section. (2 lecture, 3 lab hours)

103. Advanced Field Studies (1; max total 3 if no studies repeated)
Prerequisite: upper division standing in geology. Weekend or vacation field trips to geologically important and significant areas within California and neighboring states.

104. Scientific Writing (1)
Organization of the scientific paper, involving concise and logical presentation of data. Topics include analyses of abstract writing, bibliographical format, and scientific styles regarding punctuation and footnotes.

105. Geomorphology (3)
Prerequisite: Geol 1, 1L, 2, or permission of instructor. Land forms, their origin and development; regional problems; interpretation of topographic maps. May include field trips. (2 lecture, 3 lab hours)

106. Structural Geology (3) (Former Geol 106A)
Prerequisite: Geol 1, 1L, 2 or permission of instructor. Structural arrangements of rocks; intrusive and extrusive rock structures; folding and faulting; unconformities. Outcrop patterns, structure contours, projections, maps and aerial photographs, stereonet. May include field trips. (2 lecture, 3 lab hours)

107. Field Geology Methods (3)
Prerequisite: Geol 101, 104, 106. Field trips to introduce groups of students to methods and instruments used in geologic field work; observation and description of geologic phenomena; written presentation of observed data. (1 lecture, 6 lab hours, usually on week ends)

108A-B. Field Geology (3–3) (Former Geol 108)
Prerequisite: Geol 107. Geologic reconnaissance and mapping in field groups. Written reports of areas selected for detailed study.

109. General Oceanography (4)
Prerequisite: college chemistry and biology, Geol 1 or permission of instructor. Interdisciplinary examination of physical and chemical characteristics of seawater; distribution and effects of ocean currents; geology of the ocean floor; relation of organisms to marine environment. See M Sci 101. (3 lecture, 3 lab and field hours)

110. Invertebrate Paleontology (3) (Former Geol 110A)
Prerequisite: Geol 2 and either Zool 1 or 10; or permission of instructor. Invertebrate structures and development of prehistoric animals; introduction to stratigraphic importance of fossils. May include field trips. (2 lecture, 3 lab hours)

112. Paleoecology of Marine Invertebrates (3) (Former Geol 110B)
Prerequisite: Geol 110, Zool 114, or permission of instructor. Interpretation of ancient sedimentary environments using invertebrate fossils; use of index fossils for chronologic purposes. Includes field trips. (1 lecture, 6 lab hours)

115. Ore Deposits (3)
Prerequisite: Geol 101, 106, college chemistry, or permission of instructor. Geology, mineralogy, distribution and occurrence of common ore minerals essential in industry; genesis and localization of metallic minerals. May include field trips. (2 lecture, 3 lab hours)

116. Petroleum Geology (3)
Prerequisite: Geol 106. Theories of origin of petroleum, petroleum structures, prospecting, extraction methods, techniques used in exploration and development; selected petroleum fields. May include field trips. (2 lecture, 3 lab hours)

117. Ground Water (2)
Prerequisite: senior standing or permission of instructor. Geologic and hydrologic factors related to occurrence and utilization of ground water.

118. Advanced Structural Geology (2) (Former Geol 106B)
Prerequisite: Geol 106 or permission of instructor. Tectonic framework of Europe and North America; study of selected areas in the Western Alps, Appalachians, Rocky Mountains and Sierra Madre Oriental. Advanced problems in structural geology, structural interpretation of geologic maps and aerial photographs. May include field trips. (1 lecture, 3 lab hours)

120. Marine Geology (4)
Prerequisite: Geol 1, 1L, 2. Geomorphology of the ocean basins; marine processes affecting coastal areas; economic resources of the oceans. (3 lecture, 3 lab hours)

122. Sedimentary Stratigraphy-Petrography (5) (Former Geol 111, 173)
Prerequisite: Geol 100. Identification, classification, and genetic interpretation of sedimentary rocks; relationships of these rocks in space and time based on principles of stratigraphy. (3 lecture, 6 lab and/or field hours, minimum 45 field hours)

124. Geochemistry (3)
Prerequisite: Geol 101, one year of college chemistry. Application of chemical principles to geological processes. Chemical reactions involved in origin and alterations of rocks and minerals of the earth's crust. (2 lecture, 3 lab hours)

125 Engineering Geology (3) (Former Geol 25)
Prerequisite: Geol 101, 106. Application of geology to engineering practice in construction of dams, highways, foundations, and determination of geologic hazards such as landslides. May include field trips. (2 lecture, 3 lab hours)

130T. Advanced Problems in Geology (2–3; max total 6 if no topic repeated)
Prerequisite: senior standing in geology. Topics or problems in the following fields: geology of North America, field geology, micropaleontology, advanced ground water geology, sedimentation and sedimentary rocks, geochemistry, geophysics, volcanic geology, and marine geology.

171. Igneous Petrography (3) (Former Geol 113A-B)
Prerequisite: Geol 100, 101. Identification, classification, and interpretation of igneous rocks, using the petrographic microscope and other techniques. May include field trips. (2 lecture, 3 lab hours)

189. Geology of California (2)
Prerequisite: Geol 1. Origin of geological features of the State; relation of structural, stratigraphic, and mineralogical conditions to geologic features and resources of the State.

189L. Geology of California Field Study (1)
Prerequisite or concurrently: Geol 189 or permission of instructor. Laboratory and field study of selected areas displaying features of the geology of California; written report on each trip. Minimum of 32 hours in field trips required during semester of registration in course; limited to students who can arrange transportation for field trips and share cost.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES

(See Course Numbering System-Definitions and Eligibility)

207. Advanced Geochemistry (3)
Prerequisite: Geol 124 or equivalent. Geochemical principles applied to clay mineralogy, chemical sediments, weathering, evaporites, and hydorthermal minerals.

209. Geology Seminar (3; max total 9 if no topic repeated)
Research and reporting on theories, principles, experimentation, and methods of dealing with significant problems in geology.

210. Geotectonics (3)
Prerequisite: Geol 106 or permission of instructor. Theory and applications of continental drift, plate tectonics, and sea floor spreading to understanding continental geology. Special emphasis on geology of the Americas. Structural analysis of deformed plate margins. (2 lecture, 3 lab hours)

212. Mineral and Rock Analysis (3)
Prerequisite: Geol 100, Chem 1A-B, or permission of instructor. Principles and techniques of mineral and rock analysis using universal stage, x-ray diffractometer, x-ray fluorescence analyzer, atomic absorption and flame emission spectrometers, and other techniques. (1 lecture, 6 lab hours)

222. Carbonate Petrology (3)
Prerequisite: Geol 100. Chemistry and content of carbonate rocks; introduction to organic and inorganic constituents with emphasis on diagenetic alteration. May include field trips. (2 lecture, 3 lab hours)

250T. Topics in Geology (3; max total 9 if no topic repeated)
Prerequisite: Major or minor in geology; permission of instructor. Advanced studies in such areas as hydrology, regional stratigraphy, and marine geology.

272. Metamorphic Petrology (3) (Former Geol 172)
Prerequisite: Geol 100, 101, Chem 1A-B, or permission of instructor. Identification, classification, and interpretation of metamorphic and metasomatic rocks using the petrographic microscope and other techniques. May include field trips. (2 lecture, 3 lab hours)

290. Independent Study (1–3; max total 6)
See *General Information—Independent Study.*

299. Thesis (2–6)
Prerequisite: see *Master's Degrees-Thesis Requirements.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

1120 1 2 11 480

MATHEMATICS DEPARTMENT

Professors: Kipps, A. Labarre, Zane

Associate Professors: Donohue (Acting Chairman), Ali, M. Cohen, Ewy, Nur, Woo

Assistant Professors: Arnold, Harbertson, Haslam, Lindae, W. Read, Sun, Torrance, Wagoner, Wehrly, Yeung

Part-time: P. D. Adams, Goeddel, D. L. Hudson, Rodman, G. Williams

Mathematics and related subjects play important dual roles in our culture. On the one hand mathematics is the study of pure thought in its own right; on the other, it furnishes a language for the expression of ideas in the various sciences. The courses offered by the department are designed to develop an appreciation of both roles, particularly for those who plan to continue in study, to teach, or to use mathematics in research or in applications in the various fields of pure and applied science. Certain courses are also suitable for students in other areas. See *Degrees and Credentials—General Education Requirements.*

HIGH SCHOOL PREPARATION

Two years of algebra and courses in geometry and trigonometry or a sequence of mathematics courses containing their equivalents are prerequisite to entry into either a major or a minor program in mathematics. Such study should be completed before entrance into college.

DUPLICATION OF COURSES

No credit will be allowed for Math 29 or 30 if their equivalents have been completed elsewhere, or if taken after completion of Math 71 or 75. No student transferring credit in calculus will receive more than a total of 12 units of credit for equivalents of Math 75, 76, and 77.

ADVANCED PLACEMENT CREDIT

See *General Information—Advanced Placement*

BACHELOR OF ARTS DEGREE

The department offers a program leading to the bachelor of arts degree. The program consists of a basic set of required courses giving a strong, well-rounded mathematical background, with an opportunity to elect additional courses according to individual interests. Courses are offered in the following areas; preparation for graduate study in mathematics teaching mathematics, application in industrial or related fields. The attention of those interested in teaching mathematics in the elementary school is directed to the mathematics minor program.

MAJOR

	Units
Math 75, 76, 77	12
Math 151 and 152, 161 or 162 or 165, 171	12
Elect from upper division mathematics or Math 81	15–16
	39–40

MINOR

The minor in mathematics includes 20 units of mathematics courses, of which at least 6 must be upper division. Math 29, 30 may not be applied on the minor.

CREDENTIAL PROGRAM

For information on the current credential program consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

For information about the Graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

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Foreign Language Requirement

Any student preparing for graduate work in mathematics is advised to meet the foreign language requirement of the school he plans to attend. Proficiency in the reading of at least two languages selected from French, German, and Russian is required for most doctor's degree programs; however, most graduate programs do not leave time for language study. There is usually no language requirement for a master's degree.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area IV:* Math 29, 30, 40, 41, 51, 71, 72, 75, 76, 103, 141. (See *General Education—Courses.*)

COURSES

MATHEMATICS (Math)

29. Intermediate Algebra (3)
Prerequisite: elementary algebra and geometry. Sets, functions, graphs, quadratic equations, inequalities, simultaneous equations, matrices and determinants, mathematical induction, binomial theorem, progressions, exponents and logarithms. (See *Duplication of Courses.*)

30. Trigonometry (3)
Prerequisite: intermediate algebra. Concept of a function, sine and cosine functions, tables and graphs, other trigonometric functions, identities and equations. Trigonometric functions of angles, solution of triangles. (See *Duplication of Courses.*)

40. Elements of Statistics (3)
Not open to students with credit in Math 107 or 109. Prerequisite: elementary algebra and geometry. Organization of data, descriptive measures, sampling, statistical inference, testing hypotheses, chi-square, correlation and regression.

41. Number Systems I (3) (Former Math 140)
Not open to mathematics majors or to students with credit in Math 141; designed for elementary credential. Prerequisite: elementary algebra and geometry. Development of rational number system and its subsystems from the informal point of view; sets, relations and operations, equivalence classes; definitions of number systems and operations; algorithms for operations; prime numbers, divisibility tests; ratios.

51. Elements of Modern Mathematics (3)
Prerequisite: two years high school algebra or Math 29. Logic, set theory, vectors and matrices, linear programming, permutations and combinations, probability, Markov chains, applications to business and social sciences.

71. Elementary Mathematical Analysis 1 (3)
Prerequisite: two years high school algebra, one year high school geometry. Review of algebra, analytic geometry, introduction to set theory, mathematical induction, vectors, complex numbers, limits, derivatives. (2 lecture, 1 discussion hour)

72. Elementary Mathematical Analysis 2 (3)
Prerequisite: Math 71 and trigonometry. Applications of differentiation, polynomials, rational functions, trigonometric functions, exponential and logarithmic function, conic sections, definite integral. (2 lecture, 1 discussion hour)

75. Mathematical Analysis I (4)
Not open to students with credit in Math 72; one unit allowed for students with credit in Math 71. Prerequisite: at least three and one-half years of high school mathematics including algebra, geometry, trigonometry, inequalities, functions, graphs; limits, differentiation of algebraic functions, the definite integral.

76. Mathematical Analysis II (4)
Prerequisite: Math 72 or 75. Applications of the definite integral; transcendental functions, techniques of integration, improper integrals, arc length; conic sections; polar coordinates, vectors in the plane, three dimensional analytic geometry.

77. Mathematical Analysis III (4)
Prerequisite: Math 76. Vectors in three dimensions; infinite series; partial derivatives, multiple integrals; linear algebra.

81. Applied Analysis (4)
Prerequisite: Math 77. Introduction to ordinary linear differential equations; solutions by power series and Laplace transforms. Vector analysis; line, surface, and volume integrals. Solution of systems of linear equations by matrix methods. Introduction to Fourier series. Introduction to complex variables.

103. History of Mathematics (3)
Prerequisite: Math 72 or 75. History of the development of mathematical concepts in algebra, geometry, number theory, analytical geometry, and calculus from ancient times through the 17th century, and selected topics from more recent times.

107. Introduction to Probability and Statistics (3)
Prerequisite: Math 77 or permission of instructor. Foundation for probability applications and for subsequent probability and statistics courses; common discrete and continuous probability models; applications to topics in elementary decision theory, hypothesis testing, and estimation.

108. Statistics (3)
Prerequisite: Math 107 or permission of instructor. Representations of data, regression lines; hypothesis testing, confidence intervals; normal theory; chi-square, F, 5-distributions, some nonparametric methods, analysis of discrete data.

109. Advanced Probability (3)
Prerequisite: Math 107. Models of stochastic phenomena in time; introduction to Markov chains, Poisson-, Gaussian-, and second-order stationary processes.

110. Symbolic Logic (3)
Prerequisite: Math 71 or 75 or permission of instructor. An informal treatment of the theory of logical inference, statement calculus, truth-tables, predicate calculus, interpretations applications.

111. Theory of Sets (3)
Prerequisite: Math 71 or 75 or permission of instructor. Set theory from an informal axiomatic foundation, relations and functions, cardinal numbers, ordinal numbers, applications.

116. Theory of Numbers (3)
Prerequisite: Math 72 or 75. Divisibility, greatest common divisor, Euler's function, continued fractions, congruences, quadratic residues, Diophantine equations, different forms of the Prime Number Theorem, Mobius inversion formula.

121. Numerical Analysis (3)
Prerequisite: Math 77. Finite difference and Lagrangian interpolation formulas; numerical solution of equations, systems of equations, and differential equations; principles of coding and programming computers.

123. Topics in Applied Mathematics (3)
Prerequisite: Math 77. Vector spaces and linear transformations, eigen values and eigen functions. Special types of linear and nonlinear differential equations; solution by series. Fourier transforms. Special functions, including gamma, hypergeometric, Legendre, Bessel, Laguerre and Hermite functions. Introduction to partial differential equations.

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131. Game Theory and Linear Programming (3)
Prerequisite: Math 72 and permission of instructor; or Math 76. Games of strategy, normal form of a game, minimax theorem for two-person games, n-person games, solutions of n-person games and equilibrium points, linear programming, applications.

141. Number Systems II (3)
Not open to students with credit in Math 151 or 171. Prerequisite: Math 41 or 71. Especially recommended for prospective teachers and minors. Development of the real number system and its subsystems from the formal point of view. Mathematical induction and definition by recursion. Axiomatic development of the various number systems and their interrelation.

151. Principles of Algebra (3)
Prerequisite: Math 76 or 141. Rings, integral domains, fields, polynomials.

152. Linear Algebra (3)
Prerequisite: Math 151 or permission or instructor. Linear transformations, matrices, determinants, linear functionals, bilinear forms, quadratic forms, orthogonal and unitary transformations, selected applications of linear algebra.

153. Modern Algebra (3)
Prequisite: Math 152. Group theory, field theory, elements of Galois theory.

161. Principles of Geometry (3)
Prerequisite: Math 72 or 75. The classical elliptic, parabolic, and hyperbolic geometries developed on a common framework of incidence, order and separation, congruence; coordinatization. Theory of parallels for parabolic and hyperbolic geometries. Selected topics of modern Euclidean geometry.

162. Projective Geometry (3)
Prerequisite: Math 77. Synthetic and analytic projective geometry; axioms; duality; perspective and projective correspondence; harmonic sets; coordinatization; projective collineations and correlations; polarities and conics; groups of projective, affine and Euclidean transformations.

165. Differential Geometry (3)
Prerequisite: Math 77. Study of geometry in Euclidean space by means of calculus, including theory of curves and surfaces, curvature, theory of surfaces, and intrinsic geometry on a surface.

171. Intermediate Mathematical Analysis (3)
Prerequisite: Math 77. The complete ordered field and its usual topology; extensions to the plane; continuity and uniform continuity; characterization of the differential; extended mean value theorem; intermediate value property of derivatives; characterization of Riemann integrable functions as functions continuous almost everywhere.

172. Advanced Calculus I (3)
Prerequisite: Math 171. The real number system; function theory, continuity, differentiability; partial differentiation.

173. Advanced Calculus II (3)
Prerequisite: Math 172. Multiple integrals; line and surface integrals; Fourier series and integrals; infinite series.

174. Complex Analysis (3)
Prerequsite: Math 77. Analytic functions of a complex variable, contour integration, series, singularities of analytic functions, the residue theorems with applications to the definite integral.

181. Differential Equations (3)
Prerequisite or concurrently: Math 81 or 123. Definition and classification of differential equations; general, particular, and singular solutions; existence theorems; theory and technique of solving certain differential equations; phase plane analysis; elementary stability theory; applications.

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182. Partial Differential Equations (3)
Prerequisite: Math 81 or 123 and 171. Classical methods for solving partial differential equations including separation of variables, Green's functions, the Riemann-Volterra method and Cauchy's problem for elliptic, parabolic, and hyperbolic equations; applications to theoretical physics.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191T. Proseminar (3; max total 9)
Prerequisite: permission of instructor. Presentation of advanced topics in mathematics in the field of the student's interest.

GRADUATE COURSES (Math)

(See *Course Numbering System—Definitions and Eligibility*)

202. Fundamental Concepts of Mathematics (3)
Prerequisite: Math 151, 161 and 171. Fundamental notions regarding number theory, number systems, algebra of number fields; functions.

210. Foundations of Mathematics (3)
Prerequisite: Math 110 or 151. Formal introduction to theories of inference first order theories, completeness metatheorems, consistency metatheorems, decision problems.

216. Topics in Number Theory (3; max total 6)
Prerequisite: Math 116. An investigation of topics having either historical or current research interest in the field of number theory.

221. Advanced Numerical Analysis (3)
Prerequisite: Math 121. Linear equations and matrices; parabolic, hyperbolic, and elliptic differential equations; constructive function theory.

223. Principles and Techniques of Applied Mathematics (3)
Prerequisite: Math 123 or permission of instructor. Linear spaces and spectral theory of operators.

251. Abstract Algebra I (3)
Prerequisite: Math 153 or permission of instructor. Semi-groups, groups, groups with operators, rings, fields, lattices.

252. Abstract Algebra II (3)
Prerequisite: Math 153, 251. Vector spaces, linear transformations, sets of linear transformations, Euclidean and unitary spaces, infinite dimensional vector spaces.

263. Point Set Topology (3)
Prerequisite: Math 172. Basic concepts of point set topology, set theory, topological spaces, continuous functions; connectivity, compactness and separation properties of spaces. Topics selected from function spaces, metrization, dimension theory.

265. Differential Geometry (3)
Prerequisite: Math 165, 172. Study of geometry of curves and surfaces in Euclidean space; including an introduction to Riemannian geometry and theory of manifolds.

271. Real Variables (3)
Prerequisite or concurrently: Math 173. Theory of sets; cardinals; ordinals; function spaces, linear spaces; measure theory; theory of modern integration and differentiation.

272. Functional Analysis (3)
Prerequisite: Math 271. The Lebesgue-Stieltjes integral and its generalizations, integral equations, Hilbert and Banach spaces, linear transformations (bounded and unbounded).

274. Functions of a Complex Variable (3)
Prerequisite: Math 171, 174. Representation theorems of Weirstrasse and Mittag-Leffler, normal families, conformal mapping and Riemann mapping theorem, analytic continuation, Dirichlet problem.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

291. Seminar (3)
Prerequisite: graduate standing. Presentation of current mathematical research in field of student's interest.

299. Thesis (2–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

302. Topics in Mathematics for Teachers (3; max total 6, if topic not repeated)

PHYSICAL SCIENCE

Some of the departments in the School of Natural Sciences offer courses in the physical science area. These courses may be used to satisfy requirements for general education, credential programs, or professional development.

MINOR

The minor in physical science consists of 20 units including Geog 5, Geol 1, Phys 100A-B, P Sci 21, 106. Chem 2A-B and Phys 2A-B are strongly recommended.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* P Sci 10, 21. *Area II:* P Sci 108. *Area V:* P Sci 106.

COURSES

PHYSICAL SCIENCE (P Sci)

10. Liberal Arts Physical Science (3)
Primarily for liberal arts students. Not open to students with credit or concurrent registration in college physics. Prerequisite: Elementary high school algebra or equivalent. Elementary astronomy and physics; mechanical, electrical magnetic, and optical principles; application to everyday experiences. Lecture, demonstration, discussion.

21. Elementary Astronomy (3)
Prerequisite: elementary algebra and geometry. Nontechnical fundamental principles and facts of astronomy; appreciation of the wonders of the universe.

106. History and Philosophy of Physical Science (3)
Prerequisite: permission of instructor. The development of great ideas and discoveries in physical science from antiquity to the present; special emphasis upon early Greek scientific thought.

108. Impact of Science Upon Society (3)
Basic philosophical issues and social problems attending the growth of science; study of areas in the history of science which have posed important questions for man, with special attention to the writings of eminent scientists.

180T. Topics in Physical Science (3; max total 9)
Prerequisite: permission of instructor. Detailed discussion of special topics within the realm of physical science.

IN-SERVICE COURSES

(See *Course Numbering System*)

305. Physical Science for Secondary School Teachers (3; max total 6 in any one field)

350. Physical Science for Elementary School Teachers (3–6; max total 6 in any one field)

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PHYSICS DEPARTMENT

Professors: S. Brown, Donaldson, Scott, Shacklett, J. T. Shockley
Associate Professors: Zender (Chairman), Dews, Holmes, Judd, Williamson
Assistant Professor: Lyles

The Physics Department offers programs leading to various degrees in physics, including the bachelor of arts, bachelor of science, bachelor of science with an option in astronomy, master of arts, and master of science. These programs are designed to provide a sound scientific background leading to advanced study in physics or related disciplines, professional scientific careers or careers in teaching. In addition, the Physics Department offers courses in physics and physical science which fulfill general education requirements and basic requirements of related scientific majors.

Five of the California State University and Colleges, including Fresno State, cooperate in the management of the Moss Landing Marine Laboratories on Monterey Bay, an establishment which offers regular course work and opportunities for research which are applicable to graduate and undergraduate programs. Consult the chairman of the Physics and Biology Departments. See *Special Programs—Moss Landing Marine Laboratories;* for course descriptions see *Biology Department.*

HIGH SCHOOL PREPARATION

The high school preparation for majors in the Physics Department should include mathematics through trigonometry and physics and/or chemistry. Calculus is also strongly recommended if available. Language study in French, German, or Russian would be helpful for students planning graduate study.

ADVANCED PLACEMENT CREDIT

See *General Information—Advanced Placement*

MAJORS

The bachelor of arts degree major in physics consists of 36 units of which 24 must be upper division. The bachelor of science degree major in physics consists of 46 units as listed below. For general degree regulations see *Degrees and Credentials.* There is no language requirement for either of these degrees; however, students planning graduate study are advised to prepare for the language requirement of the school they plan to attend. Students majoring in physics are strongly encouraged to use their general education and elective units to develop competence in another scientific field or relevant area. See the department adviser for recommended areas of concentration.

BACHELOR OF ARTS DEGREE IN PHYSICS

	Units
Physics Major	36
Phys 4A-B-C, 102, 120 *and* Phys 105A, 107A, 130A *or* Phys 150A-B-C (26–27 units)	
Upper division electives in physics (9–10 units)	
Additional Requirements	27–28
Math 75, 76, 77, Chem 1A-B, P Sci 106 or Math 81	
Computer programming (Engr 70 or equivalent)	
General Education and Electives	60–61
	124

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BACHELOR OF SCIENCE DEGREE IN PHYSICS

	Units
Physics Major	46
Phys 4A-B-C, 102, 105A-B, 107A-B, 115, 120, 130A-B, 140, 170A-B	
Additional Requirements	31
Math 75, 76, 77, 81, 123, Chem 1A-B	
Computer programming (Engr 70 or equivalent)	
General Education and Electives	51
	128

Physics Major, Astronomy Option	46
Phys 4A-B-C, 22A-B, 102, 105A-B, 108A-B, 109A-B, 110, 115, 140	
Additional Requirements	31
Math 75, 76, 77, 81, 123, Chem 1A-B	
Computer programming (Engr 70 or equivalent)	
General Education and Electives	51
	128

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE IN PHYSICS

In addition to the specific courses listed below, general education requirements and electives should be included to bring total to 15–17 units per semester. A total of 128 units must be completed for the bachelor of science degree. (See *Degrees and Credentials.*)

1st Year:	Phys 4A, Math 75, 76, computer programming
2nd Year:	Phys 4B-C, Math 77, 81, Chem 1A-B
3rd Year:	Phys 102, 105A-B, 120, 140, Math 123
4th Year:	Phys 107A-B, 115, 130A-B, 170A-B
	or (assuming credit for Math 75)
1st Year:	Phys 4A-B, Math 76, 77, computer programming
2nd Year:	Phys 4C, 102, Math 81, 123, Chem 1A-B
3rd Year:	Phys 105A-B, 120, 140, 170A-B
4th Year:	Phys 107A-B, 115, 130A-B

MINOR

A minor in physics for a bachelor's degree requires 18 units of which 6 must be upper division.

CREDENTIAL PROGRAM, SECONDARY TEACHING

Students majoring in physics who wish to teach on the secondary level should consult the School of Education and see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in physics is intended for secondary school teachers or prospective teachers who desire more training in physics. For specific requirements, consult the chairman of the department; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies. There is no foreign language requirement for this degree.

MASTER OF SCIENCE DEGREE

The master of science degree in physics is designed for graduates who desire further graduate study or industrial employment in physics and allied fields. Undergraduate preparation equivalent to a physics major at Fresno State is necessary for admission. For specific details of the program, consult the chairman of the department; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the Dean, School of Graduate Studies. There is no foreign language requirement for this degree;

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however, candidates intending further study are advised to meet the language requirement of the prospective university.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* Phys 1A-B, 2A-B, 4A, 4B, 22A-B, 55. (See *General Education—Courses.*)

COURSES

PHYSICS (Phys)

Note: Math 77, Phys 4A-B-C are prerequisite to all upper division and graduate physics courses, except Phys 100A-B, 109A-B, 145, 175T.

1A-B. Physics for Biologists (4–4)
Prerequisite: two years of high school algebra or Math 29 or permission of instructor. Essentially the same physical content as Phys 2A-B but with all theory, applications, and experimental techniques directed toward the investigation, description, and analysis of biological systems. (3 lecture, 3 lab hours)

2A-B. General Physics (4–4)
Prerequisite: two years of high school algebra or Math 29 or permission of instructor. Mechanics, properties of matter, heat, sound, light, electricity and magnetism, and modern physics. (3 lecture, 3 lab hours)

4A. Mechanics and Wave Motion (4)
Prerequisite: Math 76 (or concurrently). Statics, forces, motion, properties of matter, wave motion. (3 lecture, 3 lab hours)

4B. Electricity, Magnetism, Heat (4)
Prerequisite: Phys 4A, Math 75, 76. Electrostatics, concepts of field and potential, capacitance, D.C. circuits, chemical and thermal effects, magnetic fields, induced current, alternating current circuits, temperature, calorimetry, heat flow, thermodynamics. (3 lecture, 3 lab hours)

4C. Light and Modern Physics (4)
Prerequisite: Phys 4B, Math 75, 76. Interference and diffraction phenomena, optical instruments, spectra, atomic structure, radioactivity, X-rays, and nuclear physics. (3 lecture, 3 lab hours)

22A-B. General Astronomy (3–3)
Prerequisite: Phys 2A or 4A or permission of instructor. Survey of astronomy including astronomical coordinate systems, telescopes, solar system, stars and stellar systems, galaxies and cosmology. (Occasional observation or lab hour)

55. Sound (3)
For music students and others interested in the physical basis of music. Vibrations and spectra of various musical instruments; harmony and discord, the tempered scale; acoustics; reproducing instruments; hearing.

100A-B. Modern Physics (2–2)
Prerequisite: Phys 2A-B or equivalent. Classical and quantum physics, electromagnetic spectrum, relativity, radiation and atomic structure, wave nature of matter, natural and artificial radioactivity, properties of nuclear radiations, structure of nucleus, fission process, fusion. Topics treated without use of calculus.

102. Modern Physics (3)
Fundamental concepts of atomic and nuclear structure, transitions and radiations. Includes discussions of relativistic mechanics, quantum mechanics, solid state physics and elementary particles. Special topics as they pertain to modern developments in physics, engineering, and chemistry.

105A-B. Analytical Mechanics (3–3)
(A) Analytical and vector treatment of the fundamental principles of statics, kinematics, and dynamics. (B) Advanced dynamics; harmonic motion, central force fields and Lagrange's equations.

107A-B. Intermediate Electricity and Magnetism (3–3)
Prerequisite: Phys 105A. (A) Mathematical analysis of electrostatics and magnetostatics, Gauss' law, solutions of Laplace's equation, images, theory of conduction, magnetic potentials. (B) Motion of ions in electric and magnetic fields, electromagnetic induction, Maxwell's equations and wave propagation, electron theory and magnetic properties.

108A-B. Astrophysics (3–3)
Prerequisite: Phys 22A-B, 102, 105A. Telescopes, spectrographs, classification of stellar spectra, formation of absorption lines, radiative energy transport, multicolor photometry, interstellar material, energy generation in stars, stellar evolution, clusters.

109A-B. Practice in Observation (2–2)
Prerequisite: Phys 22A-B. Modern astronomical techniques of observation, experiments and projects in multicolor photometry, spectroscopy, visual observations, photography, telescope operation.

110. Physical Optics (3)
Theory of optical phenomena; wave theory of light with applications to optical instruments; interference and diffraction phenomena, dispersion, polarization.

115. Quantum Mechanics (3)
Prerequisite: Phys 102, 105A or equivalent, Math 81. Historical background, postulates, meaning and methods of quantum mechanics; applications to atomic phenomena.

116. Quantum Physics of Atoms (3)
Prerequisite: Phys 115 or Chem 115. Quantum mechanics applied to atomic and nuclear physics.

120. Electrical Measurements (3)
Theory, operation and use of electrical and electronic instruments and circuits commonly used in science laboratories. (2 lecture, 3 lab hours)

130A-B. Advanced Laboratory (2–2)
Prerequisite: Phys 102, 120; senior physics major. Advanced experiments in mechanics, electricity and magnetism, atomic and nuclear physics. Opportunity for at least one individual project. (6 lab hours)

140. Thermodynamics and Kinetic Theory (3)
Prerequisite: Math 81. Fundamental concepts and laws of classical thermodynamics. Rudiments of kinetic theory and statistical thermodynamics with application to physical and chemical systems.

145. Geophysics (3)
Prerequisite: Phys 4A-B-C or 2A-B, Math 75. Basic principles of physics applied to the solution of geological problems, rotation and figure of the earth, the gravity field, seismology and the earth's interior, geomagnetism, and the thermal history of the earth.

150A-B-C. Modern Physical Theory (3–3–3)
Physical theory at the intermediate level. Newtonian and Relativistic particle mechanics, rigid body mechanics, electromagnetism and physical optics; statistical mechanics, thermodynamics, thermochemistry, chemical equilibria, selected topics from nuclear physics. Emphasis on applications to fields such as chemistry and biology.

162. Solid State Physics (3)
Prerequisite: Phys 115 or Chem 115. Classification of solids; crystalline state and lattice vibrations; properties of metallic lattices and dielectrics; magnetic properties of solids; free electron theory and band theory of metals; semiconductors; imperfections.

170A-B. Mathematical Physics (3–3)
Application of mathematical methods to the solution of problems in physics.

175T. Topics in Contemporary Physics (3; max total 12)
Designed to provide students with special work in such areas of physics as plasmas, high energy physics, solid state, nuclear structure, astrophysics, low temperature phenomena.

180. Seminar in Physics (1; max total 3)
Prerequisite: senior or graduate physics major or permission of department chairman.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (Phys)

(See *Course Numbering System—Definitions and Eligibility*)

203A-B. Theoretical Physics (3–3)
Advanced treatment of classical analytical mechanics including Lagrange's and Hamilton's formulation of the laws of motion, special relativity, small oscillation theory, hydrodynamics.

220A-B. Advanced Electricity and Magnetism (3–3)
Electromagnetic theory and its applications; solutions of Laplace's equation; electromagnetic potentials; cylindrical and spherical waves; retarded potentials; Lienard-Wiechert potentials; special relativity and electron theory.

221A-B. Atomic and Nuclear Physics (3–3)
The nature of matter and radiation as deduced from the classical quantum and quantum mechanical theories; atomic and nuclear structure; the nature of the nucleus as deduced from classical, quantum and quantum mechanical theories; models of nuclear structure.

222A-B. Quantum Mechanics (3–3)
Nonrelativistic quantum theory; state vectors and Hermitian operators, quantum mechanical pictures and representations, angular momentum, perturbation theory. Application to central force problems; hydrogen and helium atoms, scattering. Foundations of quantum field theory. Application of Group Theory to Quantum Mechanics.

223. Statistical Mechanics (3)
Theoretical principles of classical and quantum statistics.

250A-B. Chemical Physics (3–3)
Application of Quantum and Statistical Mechanics and Group Theory to describing atomic structure, bonding; atomic and molecular spectroscopy; the kinetic theory of gases; relation of the bulk properties of matter to molecular structure and molecular interactions.

253A-B. Astrophysics (3–3)
Radiant energy, atomic spectra, excitation and ionization, positional astronomy, magnitude systems, binary and variable stars, colors and star temperatures and stellar spectra. Continuous stellar radiation, theory of line formation, stellar interiors, stellar evolution, interstellar matter, galactic structure and galaxies.

280A-B. Group Study of Selected Topics (3–3)

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299. Thesis or Project (2–4; max total 4)
Prerequisite: See *Master's Degrees—Thesis Requirements.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

PSYCHOLOGY DEPARTMENT

Professors: W. Holder (Acting Chairman), Abou-Ghorra, Burton, Button, Cooper, Fisher, G. Leavitt, Lindquist, H. E. Madden, Powell

Associate Professors: Breen, Coe, Franklin, Grossman, Kirtley, Moerk, Shanab, James Mitchell Smith

Assistant Professors: D. Basden, Newell

Part-time: B. Basden, Berry, Bolton, Draper, Dunn, Grover, E. Holder, Katz, Langley, Pedersen, Roland, Schuman

The Psychology Department offers work leading to the bachelor of arts and the master of arts degrees.

Required core courses provide the basic language, the empirical and conceptual knowledge, and the research experiences necessary to deal with psychological materials. Twelve additional units from outside the field of psychology are required to encourage breadth in the major. Students should work closely with their advisers in selecting the psychology electives which will best satisfy their individual needs and interests. Those students planning to pursue graduate work in psychology should check carefully with their advisers and the graduate schools of their choice regarding requirements for admission and should plan to use their electives within the major largely to satisfy such requirements.

PREPROFESSIONAL PREPARATION

A psychology major is often used as preparation for other professions. For preprofessional programs in law, dentistry, medicine, and the ministry, see the *Preprofessional Preparation* section and consult an adviser in the Psychology Department.

PSYCHOLOGY MAJOR

The major consists of a core of five basic courses, selected specialized courses, and electives in psychology. With departmental approval students may make adaptations in their programs to fulfill specific needs and career objectives.

	Units
Psych 25, 50, 110T, 125T, 150T	20
Psych 130T, 135T, 140T, 155T, 160T	4
Psychology electives	12
(6 units may be lower division psychology courses, excluding Psych 10; up to 6 units may be substituted from Anth 102, 104, Soc 153, Biol 120, Phil 110.)	
	36

Additional Requirements: 12 units from at least three fields—anthropology, biological science, foreign language, linguistics, literature, mathematics, philosophy; courses must be upper division except in foreign language and must be in addition to general education requirements.

PSYCHOLOGY MINORS

General Psychology Minor	*Units*
Psych 25, 50, 110T, 125T or 150T	16
Psychology electives	6
	22

Recommended: Math 51.

Psychology Minor for Speech Pathology and Audiology

Psych 66, 111, 145	9
Elect from: Psych 25, 119, 120, 152, 168, 175	12
	21

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see section on *Public School Credential.* For information concerning the *Standard Designated Services Credential with Specialization in Pupil Personnel Services,* consult the Advanced Education Department.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in psychology is based on the equivalent of the undergraduate major in psychology at Fresno State. To be classified as a graduate student in psychology the student must have an undergraduate average in psychology of B or better. The master's degree program in psychology may serve as preparation for junior college teaching, for professional employment requiring a master's degree, or for additional work toward a doctorate. The program may be arranged to include interest areas such as clinical-developmental, general-experimental, and personality-social. Additional details pertaining to the master's degree may be obtained from the chairman of the department; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* Psych 10. *Area II:* Psych 60T, 145, 160T. *Area IV:* Psych 25. *Area V:* Psych 66, 111, 170T. *(See General Education—Courses)*

COURSES

PSYCHOLOGY (Psych)

Note: Psych 10 is prerequisite to all upper division psychology courses.

10. Introduction to Psychology (3)
Not open to students with more than six units in psychology. Introduction to psychology as an empirical science; biological and social bases of behavior; scientific principles of psychology in perception, learning, motivation, intelligence and personality. (usual section 2 lecture, 2 lab hours)

25. Elementary Statistics (4)
Prerequisite: two years high school algebra or Math 29; Math 51 recommended. Descriptive statistics and elementary hypothesis testing in the behavioral sciences. (3 lecture, 2 lab hours)

36. Elements of Neuropsychology and Psychophysiology (3)
Functioning of the brain in learning, memory, motivation, and emotion; human physiological correlates of emotional states, pain, dreaming; control of brain waves and internal states.

50. Research Design and Methods (4)
Prerequisite: Psych 10, 25. Basic course in experimental psychology; research design statistics; introduction to scientific attitude and methods in psychology; emphasis on student participation in research and report writing. (2 lecture, 4 lab hours)

60T. Psychology as Social and Behavioral Science (2–5; max total 9 if no topic repeated)
Not open to students with more than 7 units in psychology. Problems in approaching man as a social animal; sections in basic or applied processes in personality, interpersonal relations, adjustment to social environment, and group participation. (Some sections may have lab hours.)

66. Differential Psychology (3)
Basic considerations in the problems of individual and group data, heredity and environment, genetics and maturation.

104. Intermediate Statistics in Psychology (3)
Prerequisite: Psych 25, 50. Advanced procedures in analysis and interpretation of psychological data. (2 lecture, 2 lab hours)

110T. Problems in Psychological Theory (4; max total 12 if no topic repeated)
Sections covering theoretical issues in psychology; topics in history of psychology and contemporary systems.

111. Mental Hygiene (3)
Basic processes in adjustment; mental health and social problems; application of principles of emotional health.

115T. Theoretical Formulations in Psychology (2–5; max total 9 if no topic repeated)
Specialized theories in psychology and foundations for theory building; intensive investigation of theories of limited scope.

119. Child Psychology (3)
The dynamics of development and adjustment.

120. Adolescent Psychology (3)
Adjustment of youth to self and society.

123. Maturity and Old Age (3)
Psychological study of maturity and old age; physiological and sociological considerations.

125T. Problems in Learning and Motivation (4; max total 12 if no topic repeated)
Prerequisite: Psych 50. Empirical evidence and theoretical issues in learning and motivation processes; research activity and reporting. (3 lecture, 3 lab hours)

130T. Topics in Psychological Processes (2–5; max total 12 if no topic repeated)
Prerequisite: Psych 25. Basic psychological processes such as sensation, perception, thinking, and comparative psychology; conceptual and empirical issues. (Usual section 4 units, 3 lecture, 3 lab hours.)

135T. Topics in Physiological Psychology (4; max total 8 if no topic repeated)
Prerequisite: Psych 25, 50, or permission of instructor. Physiological structures and functions which underlie behavior; sections include such topics as brain processes; physiological bases of learning, emotions, motivation, and behavior; specialized lab experience. (2 lecture, 4 lab hours)

140T. Topics in Quantitative Psychology (2–5; max total 12 if no topic repeated)
Prerequisite: Psych 25, 50 or permission of instructor. Sections designed to concentrate on measurement, statistics, mathematical applications, computer applications, and instrumentation. (Most sections have lab hours.)

145. Social Psychology (3)
The interaction of individuals in groups.

150T. Problems in Personality, Developmental, and Social Psychology (4; max total 12 if no topic repeated)
Prerequisite: Psych 25, 50 or permission of instructor. Wholistic levels of analysis in psychology such as personality, social, and developmental; conceptual and empirical issues. (Usual section 3 lecture, 3 lab hours)

152. Abnormal Psychology (3)
Theoretical examination of origins, symptoms and treatments of personality disturbances.

155T. Topics in Personality and Social Processes (2–5; max total 12 if no topic repeated)
Prerequisite: Psych 25. Specialized subjects in social and personality psychology such as attitude change, social conformity, personality test construction, culture and personality. (Some lab or field work)

160T. Topics in Clinical Processes (2–5; max total 12 if no topic repeated)
Prerequisite: permission of instructor. Examination of individual behavior and small-group processes; includes such topics as clinical psychopathology, sensitivity training, and intragroup dynamics.

163. Psychological Tests (3)
Prerequisite: Psych 25 or equivalent. Theory of psychological measurement with emphasis on group testing. (2 lecture, 3 lab hours)

167. Psychology of Mental Retardation (3)
Psychological aspects of mental retardation; parent-child problems, etiology, nosology, school placement, institutionalization, treatment and recognition of all types; parent and child counseling.

168. Psychology of Exceptional Children (3)
Not open to students with credit in A S 115. The atypical child; etiology, symptomatology, nosology, recognition and recommendations.

170T. Topics in Applied Psychology (2–5; max total 12 if no topic repeated)
Applications of psychology; human factors; clinical psychology, learning applications, creativity, psychology of religion, and others. (Some lab sections)

174. Principles and Techniques in Guidance (3) (See A S 174)

175. Family Counseling (3)
Prerequisite: permission of instructor. Psychodynamic treatment of family problems; methods of counseling; psychotherapy.

180T. Seminar in Psychology (1–5; max total 12 if no topic repeated)
Prerequisite: 9 units in psychology, permission of instructor. Undergraduate seminar in specialized areas and new developments in psychology.

181. Industrial Psychology (3)
Occupational assessment; training procedures; production efficiency; morale determinants; human engineering; decision processes; organization theory.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

199. Senior Thesis (2–4)
Concentrated empirical or theoretical study of specific topic in psychology; emphasis on independent and creative activity; completed thesis defended before three-man committee including thesis sponsor. (Copy of thesis remains in permanent file in Psychology Department)

GRADUATE COURSES (Psych)

(See *Course Numbering System—Definitions and Eligibility*)

200T. Seminar in Psychology (3)
May be repeated with different topics. Prerequisite: permission of instructor. Seminars in psychodynamics, personality, psychological measurement, counseling and psychotherapy, genetic psychology, experimental psychology, social psychology, applied psychology, learning, research design, physiological and comparative psychology, theoretical problems.

201. Seminar in Experimental Methods (3)
Prerequisite: permission of instructor. Measurement and analysis in behavioral research. (2 lecture, 3 lab hours)

202. Seminar in Psychometrics (3)
Prerequisite: Psych 104, permission of instructor. Survey and test design and analysis in behavioral research. (2 lecture, 3 lab hours)

203. Proseminar in Psychology (2)
Prerequisite: permission of instructor. Presentation of faculty and student reports; discussion of contemporary issues in psychology.

204. Advanced Statistical Methods (3)
Prerequisite: Psych 104 or equivalent. Advanced parametric and non-parametric statistics and their application in psychological research. (2 lecture, 3 lab hours)

205. Readings in Psychology (1–3; max total 8 if no topic repeated)
Prerequisite: permission of instructor. Individually directed readings in areas of interest or need; appropriate reports and evaluation required. Individual conferences.

207. Seminar in Learning and Related Areas (4)
Prerequisite: undergraduate core in psychology or equivalent. Advanced current developments in learning, sensation and perception, physiological and comparative psychology. (3 lecture, 3 lab hours)

208. Seminar in Personality and Related Areas (4)
Prerequisite: undergraduate core in psychology or equivalent. In-depth examination of the recent developments in personality, clinical, genetic, social thought and language, and psychometric psychology.

209. Seminar in Advanced Psychological Theory (3)
Prerequisite: permission of instructor. Current psychological literature; theoretical significance.

218. Mental Hygiene and Guidance of Children (3) (See A S 218)

224. Counseling Techniques (3) (Same as A S 224)
Prerequisite: A S 174 or permission of instructor. Interviewing; directive and nondirective counseling techniques.

224F. Field Work in Counseling (2–12) (Same as A S 224F)
Prerequisite: Psych 224, 25 units of pupil personnel services credential sequence, permission of instructor one semester in advance of assignment. Supervised practice in counseling in a college or high school counselor's office.

262. Diagnostic Clinical Interviewing (3)
Prerequisite: Psych 152 and permission of instructor. Principles and techniques of interviewing; integration of case history, case study, psychodynamics, and psychometric data.

263. Therapeutic Clinical Interviewing (3)
Prerequisite: Psych 152 and permission of instructor. Practice in interviewing; use of available field resources such as schools, clinics, hospitals. (3 lecture hours, field work)

264. Diagnosis of Exceptional Children (3; max total 6, 3 on master's degree)
Prerequisite: Psych 265, 268, and permission of instructor. Advanced administration and interpretation of individual and group techniques. Field work under supervision.

265. Individual Mental Testing (3) (Same as A S 255)
Prerequisite: Psych 163, permission of instructor. Administration, interpretation, and use of current individual intelligence tests.

266A. Projective Techniques (3)
Prerequisite: Psych 152, 265, permission of instructor. Seminar on basic assumptions and applications of projective devices.

266B. Projective Techniques (3)
Prerequisite: Psych 266A, permission of instructor. Seminar on administration and scoring of projective devices.

267. Externship-Internship: Case Studies (2–12; max total 12, for master's degree 6)
Prerequisite: Psych 224, 265, 268, admission to candidacy for master's degree or to credential program; permission of instructor. Diversified experience in evaluation and case study; reading, speech and children's clinics, schools, special classes, hospitals, staff conferences and clinical practicum. Supervision by college and facility staffs.

268. Advanced Psychological Testing (3)
Prerequisite: Psych 163, permission of instructor. Administration, scoring, and interpretation of psychological tests; to include social maturity measures, physical-motor development, group and nonverbal intelligence measures, specific learning problems, emotional and personality appraisal.

269F. Field Work in the Psychology of Assessment (1–3)
Prerequisite: concurrent registration in specified courses and permission of instructor. Clinical field experience in the application and interpretation of selected psychological assessment techniques.

270T. Seminar in Applied Behavioral Science (1–6; max total 15 if no topic repeated)
Topics in applied behavioral research; conflict management, group dynamics, organization development, sensitivity training, and related processes. For students in the fields of business, communications, education, psychology, and the social sciences.

271. Group Techniques (3)
Prerequisite: permission of instructor. Application of group process techniques to counseling, therapy, schools, and industrial settings. (3 lecture hours, field work)

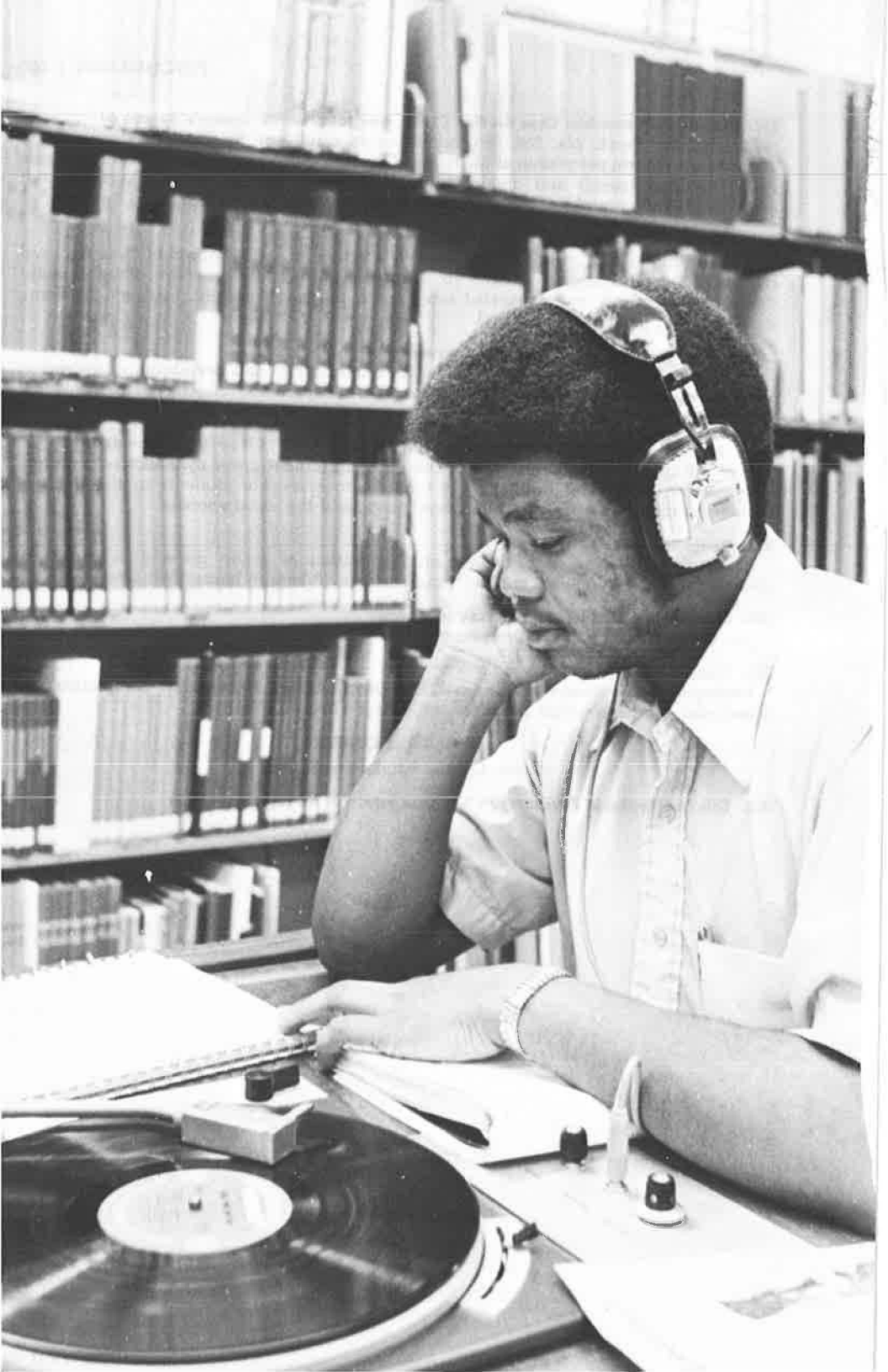
290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299. Thesis (2–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES

See *Course Numbering System.*

302. Selected Topics in Psychology (1–3; max total 9 if no topic repeated)



SCHOOL OF PROFESSIONAL STUDIES

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SCHOOL OF PROFESSIONAL STUDIES

Arthur H. Margosian, Dean

Assistant Deans ..... Octavio Tocchio, Phillip N. Walker

Department	*Chairman*
Aerospace Studies	Alastair W. Thompson
Allied Health Professions Program	Edward Berg (Director)
Communicative Disorders	Jon M. Fitch
Criminology	Frank M. Boolsen
Health Science	Henry F. Fricker
Home Economics	Carlene Rose
Industrial Arts and Technology	Frank E. Schroeter
Journalism	John H. Duke
Music	Wilson W. Coker
Nursing	Mary G. Patterson
Physical Education and Recreation	J. Gene Bourdet
Radio-Television	John H. Highlander
Theatre Arts	Gaylord O. Graham

The departments of the School of Professional Studies provide programs leading to the bachelor of arts, the bachelor of science, the master of arts, and the master of science degrees. Preparation is offered for professional careers in the specialized areas of physical therapy, rehabilitation counseling, speech and hearing therapy, law enforcement and corrections, manufacturing and construction, dramatic arts, health science, home economics, journalism, music, nursing, physical education and recreation, and radio-television and in the general areas of teaching, business, and military, public, or governmental service. For specific degrees and programs, refer to the individual departmental information on the following pages.

In addition, the School of Professional Studies offers the bachelor of vocational education degree in those occupational fields which qualify under the State of California Swan Act.

AEROSPACE STUDIES DEPARTMENT

Professor: A. Thompson (Chairman)
Assistant Professors: Link, Marsters

MINOR

A minor in aerospace studies consists of satisfactory completion of the AFROTC program (19 units). Open to men and women.

AIR FORCE RESERVE OFFICER TRAINING CORPS PROGRAM

This four-semester program is designed to provide students with the opportunity to develop professional, academic, and leadership attributes essential to their progressive advancement to positions of responsibility as officers in the United States Air Force. Successful completion of the program leads to a reserve commission as a Second Lieutenant in the United States Air Force upon graduation.

Students enrolled in AFROTC receive $100 a month nontaxable financial assistance during the two-year program, for a total of $2,000. In addition, ample Air Force scholarships are available which cover full tuition, allowance for books, laboratory fees, and incidental fees. All AFROTC payments and other benefits are in addition to those a veteran is entitled to under the GI Bill, other laws, or scholarships.

A 35-hour flight instruction program and an opportunity to qualify for a private pilot's license is offered to pilot candidates at government expense.

Students attending the six-week summer field training (A Sp 25) are provided meals, quarters, travel expenses, and are paid approximately $432.

Applications should be submitted to the Professor of Aerospace Studies during the sophomore year or the fall semester preceding anticipated enrollment in AFROTC.

Students with prior military service should consult the Professor of Aerospace Studies for applicable entrance requirements.

Students with any academic major may apply for admission to AFROTC. To be eligible a student must

(1) Be a citizen of the United States and not less than 17 years of age.

(2) Be physically, mentally, and morally qualified in accordance with standards established by the Department of the Air Force and have a minimum of four semesters, either undergraduate or graduate, remaining to be completed at Fresno State.

(3) Successfully complete the Air Force Officer Qualifying Test.

(4) Successfully complete the Air Force physical examination.

(5) Be not more than 26½ years of age, if programmed for flying training; or 30 years of age, if programmed for other than flying training, at date of graduation and commissioning.

(6) Be approved for AFROTC training by the Professor of Aerospace Studies and the President of the College.

COURSES

AEROSPACE STUDIES (A Sp)

25. Air Force ROTC Field Training (3)
For all nonprior-service applicants. Taken during summer preceding junior year before entry into AFROTC. Six-week field training to acquaint student with Air Force life; basic military skills; Air Force weapons and support systems; uniformity, compliance, and discipline essential to military environment. Quarters, $432 monthly allowance, and travel pay to and from designated Air Force base.

103A–B. Growth and Development of Aerospace Power (3–3)
Prerequisite: satisfactory completion of A Sp 25, or equivalent military training. Development of United States airpower; mission and organization of Defense Department; Air Force concepts, doctrine, employment; astronautics and space operations; future development of aerospace power; space programs, vehicles, systems, problems in space exploration.

103C. Air Force ROTC Field Training (3)

Prerequisite: A Sp 103A–B; A Sp 113 concurrently. Required for four-year program and prior-service cadets only. One month's military training taken during the summer at designated Air Force installations. Physical training, drill, weapon familiarization, flying, field exercises, orientation in United States Air Force base activities, and equipment. Subsistence, quarters, $267 monthly allowance, and travel pay to and from designated Air Force Base.

104A–B. The Professional Officer (3–3)

Prerequisite: A Sp 103A–B; A Sp 113 concurrently. Leadership and management; military professionalism; officer responsibilities; military justice; leadership theory, functions, practices; management principles, practices, controls, functions; systematic problem solving.

113. Leadership Laboratory (1; max total 4)

Prerequisite: A Sp 25, or equivalent military training. Must be taken each semester. Corps training is a laboratory where cadets experiment with and develop their leadership skills, techniques, and attitudes.

ALLIED HEALTH PROFESSIONS PROGRAM

Edward Berg, Director

Professor: Berg

Adjunct Professors: Holmes, Larson

Associate Professors: Stude, Townsend (Coordinator of Rehabilitation Counseling) Turnquist (Coordinator of Physical Therapy)

Fresno, already a leader in education, agriculture, and cultural activities in 1967, had gained recognition also as a major medical center for Central California. Further expansion to include a rehabilitation center emphasized the need for Fresno State to direct greater attention to the preparation of professionals in health care delivery and related training programs. The Allied Health Professions Program was initiated in 1969 as a result of these needs and the dedication of a distinguished group of educators, administrators, and civic leaders. The college holds an Associate Membership in the Association of Schools of Allied Health Professions. The program involves coordination with existing programs in nursing, health science, medical technology, dietetics, communicative disorders, and other viable programs as well as the development of new programs based on functional cooperative efforts of the academic community, the medical community, the service agencies, and the community-at-large.

PHYSICAL THERAPY

In order to meet the critical manpower shortage in the rehabilitation health services, a curriculum has been developed to provide quality educational and fieldwork experiences in physical therapy. With the cooperation of Fresno State and hospitals as well as other clinical facilities in the greater Fresno area, highly qualified and intellectually well-rounded professionals will become available upon completion of the program.

COOPERATING INSTITUTIONS

The resources of institutions including Fresno Community Hospital, Valley Medical Center of Fresno, Saint Agnes Hospital, Sierra Hospital, U.S. Veterans Administration Hospital, and Valley Children's Hospital will be utilized to provide clinical laboratory experience. In addition, schools within the Fresno City Unified District, Fresno County Schools, and other agencies which deal with the physically handicapped will be involved. As the programs expand, additional resources will be used.

BACHELOR OF SCIENCE DEGREE WITH A MAJOR IN PHYSICAL THERAPY

A minimum of 128 semester units is required for the BS degree in physical therapy, of which at least 42 are in the major field. In order to meet the certification requirements of the American Physical Therapy Association and the Council on Medical Education and Hospitals, American Medical Association, choices from the following curricular pattern are suggested.

MAJOR

	Units
Ph Th 100, 111, 113, 120, 121, 122, 123, 131, 132, 133, 143, 170, 175A-B	42
Additional Requirements (appropriate courses may be used for general education credit) Zool 10 or Biol 10, 20; Phy 22, 23, 155, 160; Chem 1A or 2A-B; Phys 1A-B; Psych 10, 152	38–42
General Education and Electives	50–52

Recommended for inclusion: CD 100, Math 40 or 51, or equivalent Soc 1, Spch 3, PE 156A-B, and Psych 111 or 119.

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COURSES

PHYSICAL THERAPY (Ph Th)

100. Principles of Physical Therapy (3)
Orientation in comprehensive care of the disabled or handicapped patient by use of the team health care concept. Integration of the principles of the basic sciences with the procedural aspects of therapy.

111. Psychology of Physical Disability (2)
Prerequisite: Psych 10. Consideration of reactions to disability by handicapped patients, clinical methods used in therapy.

113. Pathology (2)
The study of abnormal organic functions by lecture-demonstration techniques.

120. Procedures in Physical Therapy I (4)
Theoretical and practical aspects of the important therapeutic agents; emphasis on electrotherapy, hydrotherapy, massage, thermotherapy, and related types. (2 lecture, 6 lab hours)

121. Procedures in Physical Therapy II (4)
Prerequisite: Ph Th 120. Neuromuscular and musculoskeletal aspects of physically and mentally disabled patients; manual muscle testing, joint measurements, and physiological techniques. (2 lecture, 6 lab hours)

122. Procedures in Physical Therapy III (4)
Prerequisite: Ph Th 121. Rehabilitation techniques and design. Corrective exercise design utilization as preventive or therapeutic procedures; functional activities. (2 lectures, 6 lab hours)

123. Procedures in Physical Therapy IV (3)
Prerequisite: Ph Th 122. Application of preventive and therapeutic procedures in conjunction with actual cases. Evaluation of patient care. (2 lecture, 3 lab hours)

131. Lectures in the Medical Sciences I (3)
A series of lectures, discussions, and demonstrations by specialists in the medical and surgical professions on topics covering the essential principles of the medical sciences.

132. Lectures in the Medical Sciences II (3)
Prerequisite: Ph Th 131. A continuation of the medical sciences series.

133. Physical Medicine and Rehabilitation (3)
The roles of the specialist and the physical medicine staff in rehabilitating patients with cerebrovascular, neuromuscular, and related injuries or problems.

143. Administration and Supervision (2)
The dynamic organizational function and structure of physical therapy. Framework of administrative procedures in providing health care services.

170. Clinical Preinternship in Physical Therapy (1)
Observation of clinical physical therapy procedures under supervision of hospital or public health therapists. (3 lab hours)

175A-B. Clinical Internship in Physical Therapy (4-4)
Participation within specialized areas of physical therapy in a clinical setting under supervision.

190. Independent Study (1-3; max see reference)
See *General Information—Independent Study.*

REHABILITATION COUNSELING

The graduate program in rehabilitation counseling prepares prospective rehabilitation counselors for employment in State and federal vocational rehabilitation programs, public, and private agencies. These include rehabilitation units in mental hospitals, correctional

institutions, public schools, rehabilitation agencies and centers, sheltered workshops, adjustment centers, social service agencies, and other organizations serving persons who are mentally, emotionally, socially, or physically handicapped for employment. The program also provides advanced training for persons presently employed in agencies and facilities offering services to handicapped individuals.

Emphasis is placed upon professional education for developing the skills and knowledge necessary for effective rehabilitation counseling of handicapped persons. The variety of activities performed by rehabilitation counselors necessitates a program highly diversified in character and interdisciplinary in nature. In addition to the development of a broad understanding of human behavior, techniques of individual and group counseling, interprofessional relations, vocational appraisal and adjustment, and use of community resources in facilitating rehabilitation of mentally, emotionally, socially, and physically handicapped persons are stressed.

The graduate program of study leads to the degree of master of arts in rehabilitation counseling. The program meets the professional employment requirements of state and federal rehabilitation programs throughout the United States. No teaching credential is required or awarded upon completion of the program.

INTERNSHIP

The internship in rehabilitation counseling is required of all students who have had no previous rehabilitation agency experience. In addition, observation of and participation in clinical procedures with selected clients is an integral part of the academic course content. The internship provides an opportunity for students to develop techniques and skills in connection with the total rehabilitation process. It gives students an opportunity for application of theory in the practice of rehabilitation counseling and case management in a rehabilitation setting. The internship is provided under the direction of the rehabilitation counseling program and the immediate supervision of qualified personnel in approved and cooperating rehabilitation agencies or facilities. Enrollment in the internship constitutes full-time study for the semester and is permitted for only those students who have demonstrated their readiness to undertake the experience.

COOPERATING INSTITUTIONS

Rehabilitation facilities and agencies throughout California participate in the rehabilitation counseling program by providing field experience and observation. These include offices of the California Department of Rehabilitation, Multi-Service Center, Fresno Community Hospital, Kelso School and Activity Center, Fresno Work Evaluation Project, and Santa Barbara County Mental Health Service. Other agencies are added as relationships are established. Other cooperating agencies include out-of-state rehabilitation programs that have demonstrated effective and innovative approaches to the rehabilitation of the disabled.

MASTER OF ARTS DEGREE IN REHABILITATION COUNSELING

The master of arts degree prepares rehabilitation counselors for a wide variety of positions in both public and private agencies. A working knowledge of the behavioral sciences, physiology, and elementary statistics is utilized as the foundation for academic study. Admission to classified standing in the program requires basic courses in psychology and/or counseling. The degree program requires 60 units covering two years of full-time course work, including a full semester of internship. The required core consists of a minimum of 24 units of rehabilitation counseling courses. Elective courses may be selected from a number of study areas; at least 18 units must be in 200 series courses. They may be selected from the following areas: advanced studies, counseling, criminology, home economics, psychology; social welfare, social work, special education, and communicative disorders. Although a thesis is not required, the student must demonstrate proficiency by the satisfactory completion of a comprehensive examination and fulfillment of all other degree requirements: See *Graduate Bulletin*.

GRADUATE COURSES (R C)

(See *Course Numbering System—Definitions and Eligibility*)

201. Seminar in Rehabilitation Counseling (3)
The fundamental concepts and ethics of rehabilitation counseling; historical, philosophical, organizational, and functional principles.

211. Seminar in Clinical Procedures (3)
Analysis and methodology in dealing with disability. Theoretical and practical aspects of corrective and restorative procedures are also covered. (3 class hours, field trips.)

221. Evaluation in Rehabilitation (3)
Observation and analysis of the techniques used in rehabilitation evaluation procedures. (2 lecture-demonstration, 3 lab hours)

251. Seminar in Special Problems (3)
Preparation, analysis, and presentation of case studies which involve rehabilitation of the disabled; emphasis on techniques, evaluation, and management problems.

290. Independent Study (1-3; max see reference)
See *Regulations and Procedures—Independent Study.*

296. Internship in Rehabilitation Counseling (12)
Full-time supervised field practice in rehabilitation counseling; one semester of placement in one of a variety of settings. Written assignments and collateral reading.

COMMUNICATIVE DISORDERS DEPARTMENT

Professor: Wilson

Assistant Professors: Fitch (Chairman), Baldis, K. Jensen, Mizell, Shanks, Tuder, Wadsworth

Lecturers: Meyerson, Mulder

Part-time: Jones, Laudon, Schunhoff

The department offers a bachelor of arts degree program with a major and minor in communicative disorders providing for emphasis in speech pathology, audiology, or education of the deaf. The major is designed to provide a broad and basic understanding of language, hearing, and speech disorders. The program provides a foundation for the master of arts degree in this field, which is required for certification by the American Speech and Hearing Association and the Council of Education of the Deaf.

Speech Pathology: The baccalaureate curriculum with emphasis in speech pathology and a fifth year of prescribed study may be followed to satisfy requirements for the state restricted credential in speech and hearing, standard teaching credential, certificate of clinical competence in speech pathology awarded by the American Speech and Hearing Association. Upon the completion of the graduate requirements, a student is qualified for a position in public or private schools, colleges, universities, hospitals, and community or private clinics.

Audiology: The baccalaureate curriculum with emphasis in audiology and a fifth year of prescribed study may be followed to satisfy the academic requirements for the certificate of clinical competence in audiology awarded by the American Speech and Hearing Association. There is no credential issued by the California Department of Education at this time in the area of audiology. Upon completion of the graduate program, a student is qualified for a position as an audiologist in a hospital, college or university, community clinic, or school district.

Education of the Deaf: The baccalaureate curriculum with emphasis in education of the deaf and a fifth year of prescribed study may be followed to satisfy requirements for the state restricted credential authorizing service as a teacher of deaf and severely hard of hearing children and can qualify for basic certification of the National Council on Education of the Deaf as well as for the master of arts degree.

The Communicative Disorders Department conducts a Language, Hearing, and Speech Clinic as part of its program. Any regular student may take advantage of its services without charge.

SPEECH TEST

For credential candidates. See *General Information—Entrance Examinations and School of Education—Admission to Credential Programs.*

MAJOR

	Units
C D 100, 104, 131	9
Spch 134, 160 (for emphasis in speech pathology or audiology)	7
C D 162, 163, 164 (for education of the the deaf)	6
Elect one area:	9–15
Speech Pathology (15 units): C D 101, 102, 105, 106, 132	
Audiology (15 units): C D 101, 102, 132, 133, 134	
Education of the Deaf (9 units): C D 132, 134, 136	
Approved electives:	8–15
Speech Pathology or Audiology (8 units): Spch 162, Drama 137, Psych 119, A S 153, 160, 170, C D 103, 110, 111, 113, 121, 128A-B-or C (maximum 2 units), 188T, additional communicative disorders courses, A S 160	
Education of the Deaf (elect 15 units): C D 121, 128A (1 unit), 128B (maximum 2 units), 128C (maximum 3 units), 137, 160, E Ed 107A, 132A, A S 160	
	39

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MINOR

	Units
C D 100, 104, 131, Spch 160	12
Elect one area:	9
Speech Pathology: C D 101, 102, 105	
Audiology: C D 101, 132, 133	
Education of the Deaf: C D 132, 136, 235	
	21

CREDENTIAL PROGRAM

For general information on the current credential program, consult departmental advisers and the School of Education; see the section on *Public School Credentials.* For specific credentials in communicative disorders, see below.

SPECIALIZED PREPARATION TO TEACH EXCEPTIONAL CHILDREN IN THE AREA OF SPEECH AND HEARING HANDICAPPED

The specialized preparation to teach exceptional children in the area of speech and hearing handicapped may be substituted for the requirement of a minor in the standard teaching credential (see *School of Education*). The program also provides undergraduate preparation for the master of arts degree with emphasis in communicative disorders. For additional information see credential adviser.

The specialized preparation in the area of speech and hearing handicapped includes course work, clinical practice, and student teaching as follows:

	Units
C D 100, 101, 102, 104, 105, 106, 110, 131, 132, 205, 209, 210, 215	39
Psych 119, A S 160, 218, or 230	9
Clinical requirements: C D 130 (2–4 units), 230 (2–6 units), A S 164A (4–9 units)	10
Electives: C D 103, 111, 113, 121, 133, 188T, 206, 207, 210, 211, 213, 214, 215, 232, other communicative disorders courses, A S 168, 245	6
	64

RESTRICTED CREDENTIALS

For general provisions for obtaining a restricted credential, consult departmental advisers and see *School of Education, Advanced Studies Department.*

Speech and Hearing Specialist

The restricted credential for speech and hearing specialist includes the baccalaureate degree requirements and additional units required to complete the five-year credential program.

	Units
C D 100, 101, 102, 104, 105, 106, 110, 128A (2 units), 128B (1 unit), 128C (1 unit), 131, 132, 205, 209, 210, 215	43
Psych 119, A S 153, 160, 218 or 230	12
Clinical requirements: C D 130 (2–4 units), 230 (2–6 units), A S 164A (4–9 units)	10
Elect from: C D 103, 111, 113, 121, 133, 188T, 206, 207, 210, 211, 213, 214, 215, 232, other communicative disorders courses, A S 245	13
	78

Note: The above credential includes communicative disorders baccalaureate requirements.

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Teacher of Deaf and Severely Hard of Hearing Children

The following course work, clinical practice, and student teaching are offered for students interested in teaching in the area of the Deaf and Severely Hard of Hearing.

	Units
A S 160, 218 or 230, Psych 119	9
C D 100, 104, 131, 132, 136, 137, 162, 164, 235, 262, 263, 264	31
Professional requirements: A S 164B (3 units), C D 268 (6 units)	9
	49

MASTER OF ARTS DEGREE IN COMMUNICATIVE DISORDERS

The graduate program for the master of arts degree in communicative disorders is based on the equivalent of the undergraduate major or minor in communicative disorders at Fresno State. From 18 to 24 of the 30 units required for the degree must be in communicative disorders. For specific requirements, consult the head of the department; for general requirements see *School of Graduate Studies* and the *Graduate Bulletin.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* C D 104. *Area III:* C D 101. (See *General Education—Courses.*)

COURSES

COMMUNICATIVE DISORDERS (C D)

76. Problems in Oral Expression (2) (Former Spch 76)
Primarily for prospective teachers. Oral presentation of materials; analysis and elimination of individual limitations in oral expression.

100. Introduction to Speech Pathology (3) (Same as A Ed 150. Former Sp Corr 150)
Problems of speech and language, types of communicative disorder including delayed speech and language development; classification of speech and language defects; causes and therapeutic procedures; development of spoken language in the child; speech theory in the educational processes.

101. Phonetics of American English (3) (Former Sp Corr 151)
Perceptual and physiological characteristics of speech sounds of American English; application of phonetics to the study of normal and aberrant speech patterns and to American regional dialects.

102. Psychology of Speech and Language Development (3) (Former Sp Corr 157)
Normal process of speech and language development in children; genetic, cultural, psychological, and educational concepts related to the learning of speech and language.

103. Evaluation of Speech and Hearing Disorders (3) (Former Sp Corr 152)
Prerequisite: C D 100, 101. Diagnostic and therapeutic procedures applicable to a broad spectrum of speech and hearing problems; tests and methodologies, utilizing speech and hearing equipment in a clinical setting.

104. Physiology and Anatomy of Speech and Hearing Mechanisms (3) (Former Sp Corr 156. Same as Ling 156)
Physical, physiological, and neurological basis of speech and hearing mechanisms and pathology.

105. Voice and Articulation Disorders (3)
Prerequisite: C D 100, 101, 104. The symptomology, etiology, diagnosis, and treatment of pitch, loudness, and quality as related to organic pathologies of the voice and psychological factors of voice. A comprehensive analysis of etiology, diagnosis, and rehabilitative techniques for articulatory disorders.

106. Seminar in Stuttering (3) (Former Sp Corr 153)
Prerequisite: C D 100, 102, permission of instructor. Undergraduate seminar exploring theories and therapies; psychological and educational concepts of stuttering; parent-child relationships.

110. Diagnostic Procedures (3) (Former CD 203)
Prerequisite: C D 103, 104. Selection and use of various speech, language, hearing, psychological, and sensory-motor tasks used in the diagnostic process. Team approach concepts.

111. Neurological and Physiological Basis of Speech (3)
Prerequisite: C D 104. Neuroanatomy and physiology in relation to the processes of speech and language.

113. Research Methodology in Language Disorders (3)
Methodological procedures and concepts for research in language disorders; research tools and equipment.

121. Language Acquisition (3)
Prerequisite: C D 100, 102, Spch 134. Analysis of research in the details of normal speech and language acquisition; observation and research, normal language acquisition in children; compilation of a detailed outline of specific milestones in language acquisition.

128A. Observation in Communicative Disorders: Speech Pathology (1-3; max total 3)
Observation of diagnostic evaluations; speech, language, and hearing disorders in Language, Hearing, and Speech Clinic.

128B. Observation in Communicative Disorders: Audiology (1-3; max total 3)
Observation of diagnostic evaluations; speech, language, and hearing disorders in Language, Hearing, and Speech Clinic.

128C. Observation in Communicative Disorders: Education of the Deaf (1-3; max total 3)
Observation of diagnostic evaluations; speech, language, and hearing disorders in the Language, Hearing, and Speech Clinic or in schools for the deaf.

130. Clinical Practice in Speech and Hearing Therapy (2; max total 6) (Former Sp Corr 155)
Prerequisite: permission of instructor. Supervised clinical practice in speech and hearing therapy; diagnosis of speech deficiencies, procedures of referral to other agencies, parent counseling; case records. (6 hours arranged)

131. Principles of Audiology (3) (Former Sp Corr 162)
Anatomy, physiology, and neurology of the hearing mechanism; medical aspects of deafness and surgical treatment of hearing loss; psychological and social factors.

132. Speech Reading and Auditory Training (3) (Former Sp Corr 163)
Prerequisite: C D 131. Techniques employed in training deaf and severely hard of hearing children and adults in all aspects of visual and auditory discrimination, survey of classical speech reading procedures.

133. Audiometry (3) (Former Sp Corr 164)
Prerequisite: permission of instructor. Concepts of perception of speech; testing procedures utilized in detection and evaluation of hearing loss; application of testing procedures for diagnostic and rehabilitative purposes.

134. Utilization of Amplification Systems in Educational Process (3)
Amplification systems; hearing aids and group amplification systems; techniques of their selection and utilization; physics of sound. Observation and conduct of hearing aid evaluations at the Language, Hearing, and Speech Clinic.

136. Manual Communication for the Deaf (3)
Prerequisite: permission of instructor. Development of skills necessary to communicate with deaf adults and children through use of finger spelling and the language of signs.

137. Psychology of Deafness (3)
Psychological implications and effects of deafness; psychological testing of deaf children; role of the adult deaf in our society.

160. Clinical Practice in Education of the Deaf (2; max total 6)
Prerequisite: C D 162, 163 (or concurrent). Supervised participation and practice in clinical classroom teaching of the deaf and severely hard of hearing child and adult; therapy planning, parent counseling.

162. Speech for the Deaf (2)
International Phonetic Alphabet, Bells Visible Speech, diacritical marking system and/or Yale charts, methods and devices for developing all English sounds; principles of good voice placement, enunciation, pronunciation, and phrasing. Demonstration and practice.

163. Language for the Deaf (2)
Techniques employed in the development of language with deaf children; systems of teaching techniques, construction of English sentences and grammar; methods of correcting language mistakes of the deaf child.

164. Elementary School Subjects for the Deaf (2)
Detailed study of the process of teaching reading to deaf children. Investigation of classroom procedure and presentation of content areas (math, science, social studies); integration with visual instructional materials.

188T. Topics in Communicative Disorders (2; max total 6) (Former Sp Corr 188T)
Speech pathology, audiology, education of the deaf, speech and hearing science, language disorders.

190. Independent Study (1-3; max total 6)
See *General Information—Independent Study.*

GRADUATE COURSES, COMMUNICATIVE DISORDERS (C D)

(See *Course Numbering System—Definitions and Eligibility*)

205. Seminar in Functional Speech Disorders (3) (Former Spch 253)
Prerequisite: C D 105, 106. Theories, etiologies, and therapy procedures necessary for understanding functional aspect of speech and language disorder. Emphasis given to parent interview, counseling, and parent-child interactions.

206. Communication Disorders Articulation (Phonemic) (3)
Prerequisite: C D 101, 110, 105 or permission of instructor. Nature of articulatory process; symptomatology; etiology in relation to diagnosis and appraisal of articulatory problems. Comparisons of therapy approaches; planning and conducting therapy; critical review of recent research trends in articulation.

207. Dysphasia in Adults (3)
Prerequisite: permission of instructor. The history of dysphasia; neurological concepts needed for understanding this disorder; application of linguistic theory to testing and therapy; formulation of programs for dysphasics.

209. Speech-Hearing in Public School Environment (3) (Former C D 109)
Prerequisite: C D 110; concurrent enrollment in A S 164A. Seminar in selection, application, and interpretation of diagnostic tests for public school children; demonstration and application of therapy for children with a variety of language, hearing, or speech disorders; organization and administration of school speech and hearing program.

210. Seminar in Structural Speech Disorders (3) (Former C D 210T.1, Spch 254)
Prerequisite: C D 100, 104. Theories, etiologies, and habilitative processes. Emphasis given to orofacial growth and cleft palate.

211. Programmed Instruction (3)
Prerequisite: C D 130, 160, A S 164A or B, and permission of instructor. Integration of theory; techniques and methods for developing individualized instruction utilizing programmed procedures; development of sophisticated materials for use with hearing, language, and speech clients.

213. Seminar in Neurological Speech Disorders (3) (Former C D 210T.2)
Prerequisite: C D 100, 104. Symptomatology, etiology, habilitative, and rehabilitative processes related to neurological speech disorders of children and adults.

214. Seminar in Language Disorders of Children (3) (Former C D 215T.1)
Prerequisite: C D 100, 104; 102 or 121. Etiology, symptomatology, assessment, and habilitation of language disorders in children.

215. Seminar in Voice Disorders (3) (Former C D 215T.2)
Prerequisite: C D 100, 104, 105. Nature of normal and deviant vocal production. Symptomatic assessment and voice therapy.

220. Communicative Disorders of Second Language Usage (3)
Prerequisite: Ling 134 or 146. Seminar in clinical approaches to speech and language therapy for those for whom standard English is a second language; emphasis on U. S. minority groups.

228A. Observation in Communicative Disorders: Speech Pathology (1; max total 3)
Observation in speech pathology.

228B. Observation in Communicative Disorders Audiology (1; max total 3)
Observation in audiology.

228C. Observation in Communicative Disorders: Education of the Deaf (1; max total 3)
Observation of diagnostic evaluations; speech, language, and hearing disorders in Language, Hearing, and Speech Clinic or schools for the deaf.

230. Advanced Clinical Practice, Speech Pathology (1–3; max total 3) (Former Spch 255)
Prerequisite: C D 101, 103, 105, 130. Supervised clinical practice in diagnosis and treatment of complex speech and hearing problems; causative factors; outlining plan of therapy; counseling parents; referrals.

231. Seminar in Audiology (3; max total 6) (Former Spch 260)
Prerequisite: C D 131 or permission of instructor. Projects in library research or experimentation.

232. Seminar in Differential Diagnosis of Auditory Disorders in Children (3)
Procedures for differentiating children who may have hearing deficits, mental retardation, emotional disturbances, or brain disfunction. Syndromes characteristic of these disorders.

235. History, Education and Guidance of the Deaf (3) (Former C D 135)
History of the education of the deaf; source material; research studies related to psychology, social adjustment, and learning problems of the deaf.

250. Advanced Clinical Practice, Audiology (1–3; max total 3)
Prerequisite: C D 130, 131, 132, 133. Supervised clinical practice in diagnosis and treatment of complex hearing problems; causative factors, counseling parents, etc., therapy planning.

260. Advanced Clinical Practice, Education of the Deaf (2; max total 6)
Prerequisite: C D 132, 162, 163, 164. Supervised clinical participation and practice in clinical/classroom teaching of the deaf and severely hard of hearing children and adults. Therapy planning, parent counseling.

262. Seminar in Speech for the Deaf (2)
Prerequisite: C D 162. Development of oral communication for the child who is deaf. Detailed study of the essentials of good speech and of methods of building or correcting the speech of the deaf. Projects in library research or experimentation.

263. Seminar in Language for the Deaf (2)
Prerequisite: C D 163. Investigation of language errors of the deaf. Comparative study between the hearing and the deaf in syntax of language and structure of thought. Projects in library research or experimentation.

264. Seminar in Elementary School Subjects for the Deaf (2)
Prerequisite: C D 164. Special problems and techniques of adjusting the elementary school curriculum to the needs of deaf children; innovations and research in curriculum development. Project required.

266. Instructional Strategy and Technology for the Deaf (3)
Prerequisite: C D 162, 163, 164. Development of techniques for organizing instruction for the deaf. Specialized equipment and production of visual materials used in classrooms for the deaf.

267. Instructional Practicum with the Deaf (3)
Prerequisite: C D 262, 263, 264, 266, A S 164B. Supervised practicum with deaf children within their nonresidential educational settings. Planning of instructional programs, analysis of behavior and student progress. Small group instruction.

268. Internship with the Deaf (6)
Prerequisite: C D 136, 262, 263, 264, 266, A S 164B. Supervised internship in a residential school for the deaf. Full time in residence for 8 weeks.

270. Seminar in Organization and Management of Audiology Clinics (3)
Prerequisite: C D 131, 133. Establishing, organizing, and maintaining audiology clinics in colleges and universities, hospitals, and private organizational settings. Project required.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299. Thesis (3)
Prerequisite: see Master's Degrees—Thesis requirement. Preparation, completion and submission of an acceptable thesis or project for the master's degree.

CRIMINOLOGY DEPARTMENT

Professors: Boolsen (Chairman), Dienstein, Kallam, Ray, Tocchio

Associate Professors: Pincu, Quinn, Saake

Assistant Professors: Fitzgerald, Futrell

Part-time: Aldredge, R. Anderson, Burns, Clegg, Cunningham, Daniel, I. Evans, Harris, Hill, Hopper, Justice, Libby, E. Margosian, Masters, McKinney, Nitz, Quaschnick, Swenning

The Criminology Department provides educational opportunities in the areas of law enforcement and corrections. The law enforcement program is designed for students interested in careers in law enforcement and related areas at the federal, state, and local levels of government, or in allied occupations in government, business, and industry. The corrections program is designed for students interested in careers in probation, parole, penal and correctional institutions, and other affiliated forms of work.

The department offers the bachelor of science and master of science degrees in criminology.

BACHELOR OF SCIENCE DEGREE IN CRIMINOLOGY

The bachelor of science degree in criminology with options in law enforcement or corrections is granted upon completion of a four-year curriculum consisting of 128 semester units. The general degree requirements must be completed, see *Degrees and Credentials.* Each student desiring to major in criminology must select and complete one of the options listed below. The law enforcement option requires a minimum of 30 upper division units; the corrections option, a minimum of 39 upper division units.

Law Enforcement Option

	Units
Crim 4, 7, 73, 102, 105, 106, 107, 113, 114, 128, 132, 140	36
Crim 108 (or satisfactory experience)	9
Elect from: Crim 120, 153; Soc 112, 143, 162 or Psych 145	3
Electives (upper division), approved by the adviser, in at least two of the following disciplines: criminology, ethnic studies, journalism, psychology, public administration, social welfare, sociology, speech; excluding Crim 108, 180, 181, 281, 302 series	12
	60

Additional Requirements: Soc 1 or Anth 2; Jour 17, Psych 10.

Corrections Option

Crim 74, 105, 125, 132, 133, 135, 137, 140	24
Crim 183 (or satisfactory experience)	3
Elect from: Crim 120, 153, Soc 112, 143, 162 or Psych 145	3
Elect from: S Wel 20, 121, 122T, 124, 127	6
Electives (upper division), approved by the adviser, in at least two of the following disciplines: criminology, ethnic studies, journalism, psychology, public administration, sociology, speech; excluding 302 series	24
	60

Additional Requirements: Soc 1 or Anth 2; Psych 10.

CREDENTIAL PROGRAM

For information on current credential programs, consult departmental advisers and the School of Education; see *Public School Credentials.*

MASTER OF SCIENCE DEGREE

The graduate program for the master of science degree in criminology is based on the equivalent of the undergraduate major in criminology at Fresno State. An area of occupational specialization, such as corrections or law enforcement, is required. For specific requirements consult the chairman of the department; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area II:* Crim 1, 120, 153. (See *General Education—Courses.*)

COURSES

CRIMINOLOGY (Crim)

1. Crime in America (3)
Not open to students majoring in criminology who have more than 60 units. Social justice and criminal law; state vs accused; crime and criminals; police function; prosecution; correctional process; prevention.

4. Police Operations (3)
Open only to criminology majors. Not open to students with credit in Crim 4A–B. Basic theories, objectives, and activities of the police: patrol, investigation, and traffic.

7. Firearms (2)
Open only to criminology majors. Prerequisite: permission of instructor. Use and care of firearms; explanation of situations warranting use of firearms; legal provisions and restrictions; policy covering use in performance of duty; safety precautions; nomenclature; dry firing and familiarization firing. (1 lecture, 3 range field hours)

73. Police Report Writing (3)
Not open to students with credit in Crim 72 or 74; open only to law enforcement students. Prerequisite: Engl 1 or equivalent. Principles of effective preparation of technical and narrative law enforcement reports.

74. Correctional Report Writing (3)
Not open to students with credit in Crim 72 or 73; open only to corrections students. Prerequisite: Engl 1 or equivalent. Principles of effective preparation of technical and narrative reports in correctional institutions, community service, or probation and parole agencies.

101. Police Supervision (3)
Prerequisite: Crim 102 or permission of instructor. Analysis and evaluation of sound human relations and supervisory techniques as related to effective policy performance: discipline; motivation, problem handling, personnel policies; supervisory relationships; wages; grievances; morale and safety; instruction; training.

102. Police Organization and Administration (3)
Not open to students with credit in Crim 2. Fundamentals of police organization and administration applied to field operations; records and reports, patrol; traffic; investigation; vice, crime prevention; public relations; police ethics; allied problems.

103. Middle Management in Law Enforcement (3)
Prerequisite: Crim 102 or permission of instructor. Relationship to the organization, internal-external interpersonal relationships. Role in supervision; leadership; effective communication; personnel management; research, planning and analysis; deployment and utilization of personnel; fiscal planning, execution, and control; community relations; information management; training program management; conference leadership.

104. Current Issues in Police Management (3)
Prerequisite: Crim 102 or permission of instructor. Analysis of current major police management problems from the viewpoints of both the administrator and the line operations officer which seeks the integration of established scientific knowledge with practical police experience in the various areas of police functioning.

105. Criminal Law (3)
Not open to students with credit in Crim 105A. Theory, concepts, and philosophy of substantive law and criminal offenses; analysis of court decisions and opinions through case-study method.

106. Criminal Procedure (3)
Not open to students with credit in Crim 105B. Prerequisite: Crim 105 or 105A. Criminal procedure from arrest to appeal, utilizing California materials as well as United States Supreme Court decisions binding on California courts; analysis of court decisions and opinions through case study method.

107. Criminal Evidence (3)
Not open to students with credit in Crim 105B. Prerequisite: Crim 105 or 105A. Fundamental questions of evidence and theory of proof through analysis of court decisions and opinions by case study method: judicial notice; hearsay and exceptions, business records, documentary proof, privileged communications, self-incriminations, relevance, and presumptions.

108. Directed Policing (3; max total 15)
Open only to criminology majors who are members of the College Student Police Unit. Prerequisite or concurrently: Crim 4, permission of instructor and sponsoring agency; not required of women or foreign students. Supervised field experience in police work for interpreting theories developed in parallel criminology courses. Purchase of uniform required. (Minimum of 6 field hours per unit.)

109. Comparative Police Systems (3)
Prerequisite: Crim 102 or permission of instructor. Study of selected police systems in other jurisdictions; examination of the organization; administration and operations of police agencies in the United States, Europe, the United Kingdom, and Asia.

110. Criminal Justice Information Systems (3)
Open only to criminology majors. Not open to students with credit in Crim 10. Organization and installation of police records systems; use of computer technology in records, traffic, uniform crime reporting, manpower allocation, wanted persons file checking, and communications.

113. Criminalistics I (4)
Open only to criminology majors. Prerequisite: Crim 4. Advanced study of scientific crime investigation and detection methods. Field trip may be required. (3 lecture, 3 lab hours)

114. Criminalistics II (3)
Open only to criminology majors. Prerequisite: Crim 4. Criminal identification systems; identification of persons and property; physical evidence; scientific resources and techniques. Field trip may be required.

120. Juvenile Delinquency (3)
Prerequisite: Soc 1 or permission of instructor. The problem of juvenile delinquency; portrait of delinquency; causal factors; agencies of justice; treatment process; programs for control and prevention.

121. Delinquency Prevention (3)
Not open to students with credit in Crim 136.3. Prerequisite: Crim 120 or 132. An analysis of the role of the police, correctional agencies, the courts, group and community oriented programs of the prevention and control of juvenile delinquency.

125. Correctional Law (3)
Not open to students with credit in Crim 136.2. Prerequisite: Crim 105 (or concurrently). Basic legal theories, concepts, and laws affecting juveniles and adults in the correctional process; case studies.

128. Interviewing and Interrogation (3)
Not open to students with credit in Crim 136.6. The elements of police interviews and interrogations.

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129. Detection of Deception (3)
Open only to criminology majors. Prerequisite: Crim 128 or permission of instructor. Historical, physiological, psychological and legal aspects of the analysis of detection of deception techniques; theory and practice of instrumental detection of deception and other interrogation aids; laboratory experiments in the use of the polygraph. (2 lecture, 3 lab hours)

132. Criminology (3)
Prerequisite: Soc 1 or permission of instructor. Theories of criminal behavior; sociological factors; organized crime; professional criminals; selected types of social deviants and criminal offenders.

133. Institutional Treatment of Offenders (3)
Prerequisite: Crim 132 or permission of instructor. Modern philosophy and methods in the treatment of adult offenders and juvenile delinquents in correctional institutions.

135. Probation and Parole (3)
Prerequisite: Crim 120, or 132, or permission of instructor. Principles and practices in probation and parole.

136T. Topics in Criminology (3; max total 12 if no topic repeated)
Prerequisite: Crim 132 or permission of instructor. Analysis of selected areas of criminology; deviant behavior; institutional and noninstitutional treatment; corrections; administration and management; law enforcement; criminalistics.

137. Small Groups (3)
An examination of theories and techniques of group dynamics and group therapy.

138. Correctional Counseling (3)
Prerequisite: Crim 137 or permission of instructor. Methods of orientation, guidance, and treatment by which a leader may counsel a group of individuals, direct and facilitate constructive interpersonal relationships; group approach to social reintegration in the correctional setting.

139. Counseling Techniques (3)
Prerequisite: Soc 1 or permission of instructor. Individual counseling techniques and methods used in the field of corrections.

140. Community Relations (3)
Prerequisite: Soc 1 or permission of instructor. Nature and causes of complex problems in people-to-people relations; related role of community agencies.

153. Psychology of the Criminal (3)
Psychological bases of crime; motivation, alcoholism, economic and cultural pressures; forms of crime; criminal careers.

169. Statistics (3)
A study of elementary statistical techniques with special reference to criminological problems.

170. Research in Criminology (3)
Research methodology; use of library resources; preparation and handling of materials in criminology; written report required.

180. Internship in Law Enforcement (1–6; max total 6)
Open only to criminology majors without law enforcement experience. Prerequisite: permission of instructor and sponsoring agency. Relates student's classroom studies with occupational and professional experiences. Weekly conference with field supervisor. (Minimum of 3 field hours per unit)

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181. Internship in Corrections (1–6; max total 6)
Open only to criminology majors without correctional work experience. Prerequisite: permission of instructor and sponsoring agency. Relates the student's classroom studies with occupational and professional experiences. Weekly conference with field supervisor. (Minimum of 3 field hours per unit)

183. Counseling Practicum (3; max total 6)
Prerequisite: Crim 138 or permission of instructor. Professional experience in individual and group counseling in a correctional or related agency. (Minimum of 6 supervised field hours)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES (Crim)

(See *Course Numbering System—Definitions and Eligibility*)

201. Seminar in Criminology (3)
Prerequisite: Crim 132 or permission of instructor. Theories and research in the etiology of juvenile delinquency and criminal behavior.

210. Seminar in the Administration of Justice (3; max total 9 if no topic repeated)
Prerequisite: permission of instructor. Developments and trends in the administration of justice; constitutional, statutory, and procedural problems; the police function; criminalistics; prosecution of criminal offenses; correctional administration and management.

227. Seminar in Crime and Delinquency Prevention Programs (3)
Prerequisite: permission of instructor. Policies and programs for prevention and control of delinquency and crime; evaluation of specific programs; principles of prevention and control.

233. Seminar in the Treatment of Offenders (3; max total 12 if no topic repeated)
Prerequisite: Crim 133 or permission of instructor. Detention; community-centered correctional programs; probation; institutional treatment of deviants and offenders; group approach to social reintegration; parole and post institutional guidance of released persons.

270. Problems in Criminology (1–6; max total 12 if no topic repeated)
Prerequisite: permission of instructor. Special problems in law enforcement or corrections; individual research in laboratory, library, or field work; formal written reports. Weekly conference with instructor.

281. Supervised Professional Experience (1–6; max total 6)
Open only to criminology majors. Prerequisite: permission of instructor. Supervised professional experience in law enforcement or correctional work.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

298. Directed Research (3–6; max total 6)
Prerequisite: Crim 169, 170. Directed research in criminological problems; preparation, completion, and submission of an acceptable individual project leading to the master's degree. Individual conferences, oral defense of study.

299. Thesis or Project (2–4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

302. Topics in Criminology (1–3)

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HEALTH SCIENCE DEPARTMENT

Professors: Fricker (Chairman), Fikes, Kimberly

Associate Professor: Liskey

Assistant Professors: C. Briggs, Casperson, Hardgrave

Part-time: Auernheimer, DeFries, Dick, M. Fikes, Holck, Humphrey, Leone, McColm, Schultz, Valoff

The Department of Health Science offers curricula leading to a bachelor of arts degree, including a major and minor in health science with options in health and safety, and sanitation.

These programs are designed to provide basic training for public health, safety, or voluntary health agencies; allied health professions; the Peace Corps; and elementary, secondary, and college teaching.

MAJOR

A major in health science for the bachelor of arts degree consists of a minimum of 30 units composed of a health science core and one of the options listed below. Consult the department adviser for recommended sequence of major and general education courses.

	Units
Health Science Core	15
H S 105, 110, 123, 140, 157	
Elect one option below	15–18
Health and Safety Option	
H S 106, 170, 180	
Elect from: H S 130, 161, H Ec 131, 137, Psych 111	
Environmental Health Science Option	
H S 155, 158, 161, 162, 163, 165	

Registration as a Sanitarian: Students who desire to take the *State Examination for Registration as a Sanitarian* must complete H S 152T, 185F, Ent 107, F Sci 170, and must include among their electives and general education selections the following courses: Biol 10, 157, Micro 20, Chem 2A-B, Phys 2A-B, Math 71, Anth 2, Soc 1, Engl 1, and Spch 3. Consult the departmental adviser concerning substitutions and additions. (Accredited by the State Department of Public Health.)

MINOR

The minor in health science consists of 20 units composed of the health science core requirement and 5 units from the courses required in any one option. Consult the department adviser for assistance in program planning.

MASTER OF SCIENCE DEGREE

The graduate program leading to the master of science degree in health science is based on undergraduate preparation in health science and/or related fields. For specific requirements consult the department graduate adviser; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

CREDENTIAL PROGRAMS

For information on the current credential programs consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

The Standard Designated Subjects Teaching Credential With Specialization in Public Safety and Accident Prevention Including Driver Education and Driver Training

This credential authorizes the holder to teach public safety and accident prevention, including driver education and driver training, at all grade levels and in classes for adults. Candidates for this credential, on the basis of college recommendation, must have a bachelor's degree; a valid California driver's license and satisfactory driving record; admission to the credential program and 12 semester units composed of the following courses: H S 48, 105, 148, 170, 205, 285F. For further information, consult the department adviser.

GENERAL EDUCATION REQUIREMENTS

The following course will satisfy general education requirements. *Area V:* H S 90. (See *General Education—Courses*)

COURSES

HEALTH SCIENCE (H S)

48. First Aid (2)
Standard and advanced Red Cross first aid courses; safety factors in daily living; civil defense programs. Certificates issued when requirements are met.

90. Health Science (3)
Meets general education requirements. Significance of basic health problems applicable to the young adult and to society.

105. Environmental Safety (3)
The physical environment as it relates to accidents and safety; investigation and analysis of factors involved in the areas of home, school, industry, recreation, and traffic; human factors; accidents by type, age groups, and occupations.

106. Industrial Safety (3)
Application of accident prevention principles and procedures to the occupational situation.

110. Habit Forming Substances (3)
Problems of tobacco, depressants, and stimulants including hallucinogens; use and effects on adolescents and adults.

123. Advanced Health Science (3)
Health science in the public school curriculum, with emphasis on current health problems; the determining factors in teaching content; school health programs.

130. Rural Health (3)
Health problems of rural areas including community medical services, medical facilities, federal, state, and local legislation and administrative problems.

140. International Health (3)
History and evaluation of programs of international health organizations; health problems on a world scale.

148. Teaching First Aid (1)
Prerequisite: current standard and advanced Red Cross first aid certificates. Preparation for Red Cross standard and advanced first aid instructor's certificates. Certificates issued when requirements are met.

152T. Topics in Health (1–3; max total 12)
Analysis and investigation of selected areas in environmental health, public health, and health and safety.

155. Epidemiology of Disease (3)
Modern concepts and principles of epidemiology; interaction of all agents, host, and environmental factors of communicable and noncommunicable diseases; problems of the aged.

157. Community Health (3)
Public health services as they affect the community; investigation and analysis of community health problems.

158. Public Health Statistics (3)
Prerequisite: H S 155 or permission of instructor. Public Health statistics and principles of epidemiology; methods of investigating epidemics, collecting of data, analysis and reports.

161. Environmental Health I (3)
Basic principles and concepts of environmental health with a particular emphasis on health hazards. Environmental health organizations; communicable disease and environment; contamination control, water, air, solid waste, and noise.

162. Environmental Health II (3)
Basic principles and concepts of environmental health with a particular emphasis on health hazards. Radiation, food, rodent control, managing special environments, planned environments, value systems, and community organizations.

163. Public Health Administration (3)
Principles of public health administration; fundamentals of organization and administration in public health.

165. Directed Group Study in Environmental Health (3)
Prerequisite: H S 161, 162 or permission of instructor. Problems of environmental health studied through field trips, observations, demonstrations, and seminars.

170. Driver Education and Training (3)
Prerequisite: H Sc 105, senior standing, valid California driver's license. Materials, equipment, and procedures for driver education and training including training with simulators. (2 lecture, 2 lab hours)

180. Human Sexuality (3)
Human sexuality as it pertains to the individual, school, family, and community. (2 lecture, 3 field hours)

185F. Field Work in Health (1–3; max see below)
Repeatable to 3 units in any one area, maximum total 6. To be taken concurrently with appropriate course.

190. Independent Study (1–3; max see reference.)
See *General Information—Independent Study.*

GRADUATE COURSES (H S)

(See Course Numbering System—Definitions and Eligibility)

Note: *Graduate courses in health science are in the process of revision. See the Graduate Bulletin for revisions.*

205. Seminar in Safety Problems and Programs (2)
Prerequisite: H S 105, 285F concurrently. Development, organization, and administration of safety programs; individual research, analysis, and evaluation of pertinent problems.

210. Seminar in Administration of the Health Science Program (2)
Prerequisite: H S 123, 285F concurrently. Individual research, analysis, and evaluation of the organization, administration, and legal aspects of the health science program.

220. Seminar in Physical Handicaps (2)
Prerequisite: H S 123, 285F concurrently. Individual research, analysis, and evaluation of the cause, treatment, and educational implication of crippling conditions, including cerebral palsy of preschool and school-age children; rehabilitation and adjustment problems.

223. Seminar in Health Science Education (2)
Prerequisite: H S 123, 285F concurrently; teaching experience or permission of instructor. Individual research, critical analysis and evaluation of the health science program; curriculum materials, and special techniques relating to instruction, services, and environment.

230T. Seminar in Environmental Health (3; max total 15)
Individual research, analysis, and evaluation of a topic: air pollution, solid wastes, housing, water supply, insect and rodent control, food sanitation, environmental and occupational disease.

231T. Seminar in Population Analysis (3; max total 9)
Individual research, analysis, and evaluation of a topic: epidemiology, demography, vital statistics.

232T. Seminar in Preventive Medicine (3; max total 9)
Individual research analysis, and evaluation of a topic: chronic disease, gerontology, and medical care programs.

233T. Seminar in Health Organizations (3; max total 9)
Individual research, analysis and evaluation of a topic: local, state and national organizations; voluntary health agencies; and international health.

234T. Seminar in Community Health (3; max total 9)
Individual research, analysis, and evaluation of a topic: sex education, drugs, and consumer health.

240. Seminar in International Health (3)
Prerequisite: permission of instructor. Review and critical analysis of programs of multilateral agencies functioning in international health; major health problems and their sociological, political, and economic relationship to a specific geographic region.

257. Seminar in Community Health Organization (2)
Prerequisite: H S 123, 157, 285F concurrently. Individual research, analysis, and evaluation in relation to educational aspects of community health programs; group procedures; community organizations; selection, development, and use of media.

280. Seminar in Techniques of Health Research (3)
Research methodology, identification of health research problems, use of library resources, data gathering and processing, writing a research report.

285F. Field Work in Health (1–2; max total 10)
To be taken concurrently with appropriate course. Topics repeatable to 2 units in any one area, maximum 10. Planning, implementation, participation, evaluation in selected areas: safety, school health, community health, physical handicaps, problems.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

298. Directed Research (4)
Prerequisite: advancement to candidacy for MS degree in health science. Individual research projects in health science; weekly independent and group conferences.

299. Thesis or project (2–4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES
See *Course Numbering System*

302. Selected Topics in Health (1–3)

HOME ECONOMICS DEPARTMENT

Professors: Rose (Chairman), Newsome, Smardan

Associate Professors: Caid, Hendrickson, Karikka, Kissick, Sollie, Turner

Assistant Professors: Bauer, Berrett, Bowden, Cummins, Goldbloom, Harkins, Hennings, Kilner, V. Kunimitsu, Rice

Lecturers: Winston, Yeary

Part-time: Collins, Jaschke, E. Smith

The Home Economics Department offers a major and a minor in home economics for the bachelor of arts degree and a master of science degree. Programs may be planned to provide preparation for teaching and dietetics careers. Professional preparation in teaching includes work in all areas of home economics. In addition to preparing students for a career, all curricula are planned to develop understandings applicable to family life.

The dietetics option listed below meets the requirements of the American Dietetics Association for admission to their internship program.

HOME ECONOMICS MAJOR

The bachelor of arts degree major in home economics consists of the following 48 units. With departmental approval students may make adaptations in the core for specific career objectives.

	Units
H Ec 1, 10, 11, 12, 14 or 24, 38, 39, 40, 50, 110, 131	27
Home economics electives (ud), at least 3 units to be selected from courses indicated in each of the areas listed below	15
Child Development and Family Relations: H Ec 139, 160, 161, 162T	
Clothing and Textiles: H Ec 100, 102, 103, 104, 106	
Food and Nutrition: H Ec 105, 137	
Home Management, Equipment, and Family Economics: H Ec 101, 111, 132	
Housing and Home Furnishing: H Ec 133, 170, 171, 172T	
Additional home economics electives, upper division (exclude H Ec 140)	6
	48

Additional Requirements: Chem 2A–C, Biol 10.

Recommended courses: Soc 1, Anth 2, Psych 10, Hist 1, H Ec 7 or Art 41 or 46

DIETETICS OPTION

H Ec 10, 39, 40	9
H Ec 105, 137, 138, 141, 142, 143, 144, 145, 185 or 130	26
Required for clinical dietetics H Ec 182T or 280T	(3)
	35–38

Additional Requirements: Chem 2A–B, 8, 104, 105, 109, 150, 151, (153 and 154 for clinical dietetics); Micro 20, 21. Consult the adviser for ADA requirements which may be met under the general education program.

HOME ECONOMICS MINOR

The minor in home economics consists of a minimum of 20 units, 9 of which must be upper division, including at least one course in each of the five areas listed in the major.

CREDENTIAL PROGRAM

For information on the current credential program consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

GENERAL EDUCATION REQUIREMENTS

The following courses satisfy general education requirements for nonmajors. *Area II:* H Ec 39, 131. *Area V:* H Ec 40, 42, 132 (See *General Education—Courses.*)

MASTER OF SCIENCE DEGREE

The graduate program leading to the master of science degree in home economics is based on undergraduate preparation in home economics and/or related fields. For specific requirements consult the department graduate adviser; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the Graduate Bulletin, available in the School of Graduate Studies Office.

COURSES

HOME ECONOMICS (H Ec)

1. Contemporary Home Economics (2)
Home economics in America; past and present professional needs, successes and weaknesses; future of the field. Academic preparation for a variety of occupations; participation in the worlds of work, marriage, family, and community.

7. Applied Color and Design (3)
Introduction to the application of color and design to all areas of Home Economics; properties of color, simple graphic methods, and three dimensional design. Studio work and discussions. (1 lecture, 4 lab hours)

10. Basic Food Study (3)
Introduction to food preparation and standards determining quality of food. (1 lecture-discussion, 4 lab-demonstration hours)

11. Beginning Textiles (3)
Fiber classification; methods of production; fabric construction; mechanical finishes. Selection, use, and care of fabrics in relation to consumer needs.

12. Fashion Analysis (1)
Factors influencing trends in dress. Selection of color, line and form related to individual needs.

14. Beginning Clothing (2)
Not open to students with credit in H Ec 12A. Prerequisite: H Ec 12 (or concurrently). Pattern and fabric selection; basic construction techniques, use of commercial patterns; application of these factors to consumer buying. (4 lab hours)

24. Intermediate Clothing (2)
Not open to students with credit in H Ec 12A. Prerequisite: H Ec 12 or concurrently; H Ec 14 or experience in clothing construction. Individualization of basic and designer patterns: alteration, principles; techniques of handling new fabrics. (4 lab hours)

31. Dietetics (3)
Elements of nutrition and diet in disease.

32. Preparation for Marriage (2)
Competencies needed to create home environment conducive to achieving marriage and family goals; socialization for marriage and courtship as preparation for marriage.

38. Housing and Home Furnishings (3)
Selecting and furnishing a home; design, color and functional considerations. Application of creative expression, flexibility and consumer information to home furnishings.

39. Child Development (3)
Study, with an interdisciplinary perspective, of child development, prenatal through adolescence, within the context of the family.

40. Elementary Nutrition (3)
Elementary knowledge of high school chemistry and biology strongly recommended. Scientific principles underlying normal nutritional requirements.

42. Management for Effective Living (2)
Not open to home economics majors and minors. Human relationships, housing, family finance, consumer problems, meal management and nutrition as they relate to individual and family living.

50. Household Equipment (2)
Selection, methods of operation, and care of household appliances; testing electrical equipment for efficiency and cost of operation; kitchen planning, arrangement of work, preparation and serving units. (1 lecture, 2 lab hours)

100. Tailoring (3)
Prerequisite: H Ec 12, 14, or 24. Tailoring a woman's suit or coat using various tailoring techniques (6 lab hours)

101. Consumers and the Market (3)
Consumer spending related to social and psychological factors influencing consumers. Legislation that protects and relates to the consumer on local, state, and federal level.

102. Design Through Flat Pattern (3)
Not open to students with credit in H Ec 12B. Prerequisite: H Ec 12, 14, and/or 24. Application of flat pattern methods to apparel design. (6 lab hours)

103. Advanced Textiles (3)
Prerequisite: H Ec 11, Chem 2A-B or 2A-C. New developments in man-made fibers; chemical finishes; dyes and dyeing; physical testing of fabrics. (2 lecture, 2 lab hours)

104. Design Through Draping (3)
Prerequisite: H Ec 12, 14, and/or 24. Construction and use of individual dress form; apparel design through draping. (6 lab hours)

105. Advanced Foods (3)
Prerequisite: H Ec 10, Chem 2A-B or 2A-C. Application of the behavioral, biological, chemical, physical, and social sciences to the study of foods. (1 lecture, 4 lab hours)

106. Problems in Clothing Design (3) (Former H Ec 122.4T)
Prerequisite: H Ec 12, 14 or 24, 102 or 104. Creative design through the medium of flat pattern and/or draping. Social implications of clothing. (6 lab hours)

110. Home Management (2) (Former H Ec 51)
Management concepts related to individual and family living. Analysis of values, goals, and standards and their relationship to the allocation of human and nonhuman resources in the management process.

111. Home Management Laboratory (3)
Required for credential candidates. Prerequisite: H Ec 40, 50, 105 and 110 (or concurrently). Integrated experience in various phases of home economics provided by residence in home management house. (6 lab hours)

122T. Topics in Clothing and Textiles (3; max total 12 if no topic repeated)
Prerequisite: H Ec 11, 12, 14 and/or 24, permission of instructor.

130. Experimental Food Study (3)
Prerequisite: H Ec 105. Structure and composition of foods, their behavior during processing; food research. (1 lecture, 4 lab-demonstration hours)

131. Family Relationships (3)
Interpersonal relationships within the family; needs, values, and goals of the family at various stages of its life cycle.

132. Family Finance (3)
Open to business majors by permission of instructor only. Financial activities of the individual and family; bank accounts, consumer credit, insurance, savings, and investments; wills, property laws, home mortgages; personal and family budgets.

133. History of Architecture and Home Furnishings (3)
Styles of architecture and furnishings from prehistoric times to the present; sociological, physical, economic and religious influences.

137. Advanced Nutrition (3)
Prerequisite: H Ec 40, Chem 2 A-B or 2A-C, Biol 10. Present knowledge of the metabolism of carbohydrates, fats, proteins, vitamins and minerals. Dietary study and evaluation. (2 lecture, 2 lecture-lab hours)

138. Nutrition in Disease (3)
Prerequisite: H Ec 137 or permission of instructor. Nutritional aspects and dietetic treatment of disease. (2 lecture, 2 lab hours)

139. Child Development Practicum (3)
Prerequisite: H Ec 39 or permission of instructor. Observation of and planning a variety of experiences for young children, understanding the child as a member of his family and as he relates to his peers and adults in the laboratory setting. (2 lecture, 3 lab hours)

140. Methods of Teaching Home Economics (3)
Prerequisite: admission to credential program, S Ed 150, 153 concurrently. Methods, processes, evaluation, philosophy, goals, and principles appropriate to the teaching of vocational consumer home economics. (2 lecture, 2 lab hours)

141. Institution Organization and Management (3)
Prerequisite: Mgt 110A-B, or permission of instructor. Organization and operation of institution food services; management principles; control, selection, and training of personnel; food cost control and records.

142. Quantity Cookery (3)
Prerequisite: H Ec 144, 145. Estimation of needed quantities; quantity food preparation and service; use and care of institution food service equipment. (6 lab hours)

143. Institution Experience (3)
Open only to dietetics majors. Prerequisite: H Ec 138, 141, 142, permission of instructor. Supervised work experience in hospital dietary departments. (6 lab hours)

144. Institutional Food Purchasing (2)
Prerequisite: H Ec 105, Econ 1A (B A 100 recommended). Wholesale market functions and purchase of food for institutional use, factors determining quality, yield, and cost of food.

145. Institution Layout and Equipment (2)
Prerequisite: H Ec 141. Philosophy of work simplification and its application to plant layout and equipment; materials, construction, specification, maintenance of equipment, furnishings for institutional food service units.

152T. Topics in Home Management, Equipment, and Family Economics (3; max total 12 if no topic repeated)
Effective home management and contemporary family economics.

154. Field Experience in Home Management (3) (Former H Ec 152.2)
Prerequisite: permission of instructor. Supervised field experience in teaching home management to various socioeconomic and ethnic groups.

160. Children and Family Crises (3) (Former H Ec 162T)
Prerequisite: H Ec 39 and/or H Ec 131, Psych 10, Soc 1 or Anth 2; permission of instructor. Crises experienced by children and their families; separation, dissolution, divorce, remarriage and the consequent formation of step-relationships, death, alcoholism, and drug abuse included.

161. Cultural Aspects of Child Rearing (3) (Former H Ec 162T)
Prerequisite: H Ec 39 and/or H Ec 131, Psych 10, Soc 1 or Anth 2; permission of instructor. Cultural and subcultural aspects of child rearing; survey of major research studies and findings on cultural child-rearing attitudes and practices.

162T. Topics in Child Development and Family Relationships (3; max total 12 if no topic repeated)
Prerequisite: H Ec 39 and/or 131, Psych 10, Soc 1 or Anthro 2, permission of instructor.

170. Contemporary Home Furnishings (3) (Former H Ec 172.1)
Study of the emergence and development of contemporary design in home furnishings. Significant designers and their work.

171. Housing and Society (3) (Former H Ec 152.1)
Housing requirements of individuals, families, and special groups. Analysis of human factors related to the design of housing and neighborhoods. Examination of current social problems related to housing. (2 lecture, 2 lab hours)

172T. Topics in Housing and Home Furnishings (3; max total 12 if no topic repeated)
Prerequisite: H Ec 38 and permission of instructor.

173. Applied Interior Design (3) (Former H Ec 172.3)
Prerequisite: H Ec 38; 133 or 170 or concurrently. Creative problems in interior design intended to develop the analytical approach including emphasis on integration with architecture and allied arts. Field trips, design projects, and critiques. (2 lecture, 3 lab hours)

180. Meal Management (3) (Former H Ec 182.4)
Prerequisite: H Ec 10. Principles of foods and nutrition applied to meal planning, preparation, and service. Economic, aesthetic, nutritional, and managerial aspects of meal planning. (2 lecture, 2 lab hours)

182T. Topics in Food Nutrition, and Dietetics (3; max total 12 if no topic repeated)
Prerequisite: H Ec 10, 40, and permission of instructor.

184. Food Service Education (3) (Former H Ec 182.3)
Prerequisite: H Ec 140. Curriculum development and methods of instruction in programs preparing high school students for entry-level jobs in the food service industry. (2 lecture, 2 lab hours)

185. Cultural Foods (3) (Former H Ec 182.1)
Prerequisite: H Ec 10, 40, Anth 2 recommended, permission of instructor. Dietary and nutritional practices in different cultures, as influenced by cultural and economic conditions. (2 lecture, 2 lab demonstration hours)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

192. Readings and Conference (1–3)
Individually directed readings: reports and evaluation. (hours arranged)

195. Demonstration Techniques (3)
Skills and practical experience in planning, organizing, preparing, and presenting demonstrations for home economics majors in teaching, extension, business and dietetics.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Research Methods in Home Economics (3)
Prerequisite: graduate standing. Methods, techniques of research; locating and formulating problems; collection and interpretation of data; preparation of research reports; analysis of professional literature.

260T. Seminar: Family Economics (3; max total 12 if no topic repeated)
Prerequisite: permission of instructor. Analytical study in an area of family economics: personal use of credit, intercultural approach to consumer education, economic aspects of family living, media and consumers in an intercultural society, field testing of school programs. Preparation, presentation, and defense of individual project.

280T. Seminar in Food, Nutrition, and Dietetics (3; max total 12 if no area repeated)
Prerequisite: H Ec 200, professional requirements in the field, permission of instructor.

281T. Seminar in Home Economics (3; max total 12 if no topic repeated)
Prerequisite: H Ec 200, permission of instructor.

285. Investigation in Food and Nutrition (4)
Prerequisite: Chem 150, 151, H Ec 130, 137, permission of instructor. Chem 101 recommended. Food and human nutrition studies through instrumental analysis of biological materials. Chemical and biological techniques used in food and nutrition research. Planning, conducting, and reporting food and nutrition research. (2 lecture, 6 lab hours)

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

292. Readings in Home Economics (2–3; max total 6 if no topic repeated)
Prerequisite: H Ec 200, 280T or 281 and permission of instructor. Individually directed readings in a field of special concern to students in the graduate program; appropriate reports and evaluations required; individual conferences, no formal class meetings.

299. Thesis (2–6; max total 6)
Prerequisite: see *Master's Degrees —Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES
See *Course Numbering System*

380. Topics in Home Economics (1–3; max total 9 if no area repeated)

INDUSTRIAL ARTS AND TECHNOLOGY DEPARTMENT

Professors: Schroeter (Chairman), L. Aldrich, Bliss, Dettinger, Dunning, Feuches, Foston, Gonser, Groneman, McComas, Musselman, Newcomb, Rockwell

Associate Professors: Blanton, Blomgren, Grannis, Livingston, L. Smith

Assistant Professors: Christison, Cullen, El Sadek, Gaiser, Garcia, Gullickson, Jenne, Paglierani, Winegar

Lecturers: Cook, Hartman, Panter

Part-time: Ariaz, Guaglianone, Arthur Johnson, Moshier, Nilmeier, Turano

The Industrial Arts and Technology Department offers a major and minor in industrial arts for the bachelor of arts degree, a major in industrial technology for the bachelor of science degree, and a program for the master of arts degree. The department also offers a major for the bachelor of vocational education degree. Individual programs are planned to provide for professional careers in teaching and in business and industry. The industrial technology major emphasizes physical science and industrial management as well as the subject fields within the industrial arts for students seeking technical and managerial positions in industry.

BACHELOR OF ARTS DEGREE IN INDUSTRIAL ARTS

The bachelor of arts degree in industrial arts consists of 124 units. The general requirements for the bachelor of arts degree must be completed (see *Degrees and Credentials*). Students majoring in industrial arts must complete a minimum of 40 units of industrial arts courses, 16 of which must be upper division, excluding Ind A 192, 194, 196, 199. Students may elect to do the major part of their work in certain specific areas of concentration: automotive, drafting-design, electricity-electronics, general metal, graphic arts, industrial crafts, machine tool metal, and woodworking.

Industrial Arts Major

	Units
Ind A 12, 41, 52, 60, 70, 80	18
Ind A electives (incl at least 16 u.d.)	22
	40

Industrial Arts Minor

One of the eight groups listed below should be selected for a minor in Industrial Arts.

Automotive

Ind A 12, 71, 120, 122, 124, 129	17
Industrial arts electives	3
	20

Drafting/Design

Ind A 41, 42, 140, 143, 146, 148	18
Industrial arts electives	2
	20

Electricity/Electronics

Ind A 52, 70, 152, 153, 156, 158	18
Industrial arts electives	2
	20

General Metal

Ind A 41, 70, 71, 74, 170, 178	17
Industrial arts electives (incl at least 2 u.d.)	3
	20

Graphic Arts *Units*

Ind A 60, 160, 161, 162, 166	15
Industrial arts electives	5
	20

Industrial Crafts

Ind A 70, 80, 133 (4 un), 146, 162, 178	18
Industrial arts electives	2
	20

Machine Tool Metal

Ind A 41, 70, 71, 74, 170, 174	17
Industrial arts electives	3
	20

Woodworking

Ind A 41, 80, 82, 111, 184	15
Industrial arts electives	5
	20

BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL TECHNOLOGY

The bachelor of science degree with a major in industrial technology is granted upon completion of a curriculum consisting of 128 units. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*). An option consisting of a core program of industrial arts and technology courses, courses in related areas, and the specific requirements in one or more of the emphases is required. Each student majoring in industrial technology must also complete Econ 1A–B, Physics 2A–B.

Industrial Technology Major
Manufacturing Industries Option

Required Core Program *Units*

Ind A 41, 52, 74, 101, 103, 105, 145, 146, 166, 198, 199	31
QM 60, Mgt 110A–B, 124, Chem 2A–B, Math 71, 72	24
	55

Technical Emphases

Electricity/Electronics

Ind A 102, 152, 153, 154, 156, 158	18
Electives in related areas approved by department	8
	26

Graphic Communications

Ind A 60, 147, 160, 161, 165, 167	17
Electives in related areas approved by department	9
	26

Metals

Ind A 70, 71, 170, 171, 173, 174, 175, 176	22
Electives in related areas approved by department	4
	26

Drafting/Design	*Units*
Ind A 44, 71, 140, 144, 170	14
Electives in related areas approved by department	12
	26

Transportation	
Ind A 12, 70, 71, 120, 122, 124, 129	20
Electives in related areas approved by department	6
	26

Wood Products	
Ind A 80, 82, 182, 184, 185, 187	18
Chem 8	3
Electives in related areas approved by department	5
	26

Construction Option

Required Core Program	*Units*
Ind A 42, 52, 101, 105, 110, 115, 145	21
Acct 3, Fin 180, Mgt 110A–B, QM 60, Chem 2A-B, CE 120, 120L, Math 71, 72	31
	52

Technical Emphasis

Light Building Construction	
Ind A 111, 116	6
Ag Me 91, Mktg 150, B A 18	9
Electives in related areas approved by department	14
	29

Heavy Building Construction	
Ind A 44, 112, 116, 158	12
Ag Me 91	3
Electives in related areas approved by department	14
	29

Architectural Drafting	
Ind A 44, 117, 143, 147	12
Geog 115	3
Electives in related areas approved by department	14
	29

Building Materials Industries	
Ind A 166	3
Mgt 124, QM 65, Mktg 100, 150	12
Electives in related areas approved by department	14
	29

Real Estate	
B A 18, 118, 184; Fin 181, 183	15
Electives in related areas approved by department	14
	29

BACHELOR OF VOCATIONAL EDUCATION DEGREE

The bachelor of vocational education degree is limited to vocational teachers who qualify for a Swan Bill evaluation through the State Board of Vocational Examiners. The qualifications required for such an evaluation are outlined in the *State Education Code.* Among these qualifications is the stipulation that the candidate shall have had a minimum of 1,620 hours of teaching experience in an approved vocational class or 1,000 hours teaching experience in an approved trade extension class. Additional information regarding this degree program may be obtained from the Chairman of the Department of Industrial Arts and Technology.

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and see the sections on*Public School Credentials* and *School of Education.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in industrial arts is based on the equivalent of the undergraduate major at Fresno State. Twenty of the 30 units required for the degree must be in industrial arts. For specific requirements, consult department graduate adviser; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area V:* Ind A 133, 162, 178. (See *General Education—Courses.*)

COURSES

INDUSTRIAL ARTS AND TECHNOLOGY (Ind A)

101. Energy Conversion and Utilization (3) (Former 1A 197)
Prerequisite: Ind A 52. Fundamental sources of energy including the following energy converters: direct mechanical, external combustion, internal combustion, conventional and direct electrical, and atomic. (field trips)

102. Industrial Process Control and Instrumentation (3)
Prerequisite: Ind A 52. Industrial process control system principles and components; computers, controllers, transducers, and actuators; mechanical and electrical instrumentation. (field trips)

103. Industrial Processes and Materials (3)
Chemical and physical properties of ferrous and nonferrous metals, abrasives, ceramics, finishes, plastics, wood, and other industrial materials. Structural properties, wear, corrosion strength, destructive and nondestructive testing. Fabrication applications and potentials, cutting, fusion, casting, forming, and other industrial processes.

105. General Building Construction (3)
Principles of general building construction including classes and requirements of occupancy; fire zone; type of construction; properties and uses of masonry, wood, concrete and steel; contracts and specifications. (field trips)

CONSTRUCTION AREA

110. Estimating and Bidding (3)
Basic methods used to evaluate, fix cost, calculate worth, make accurate quantity take-offs and labor time estimates; preparing bids for prospective buyers.

111. Light Building Construction (3) (Former 1A 181)
Principles of light frame construction including foundations, framing, exterior finish and related areas of layout; estimating and ordering materials; conventional and modular component systems. (field trips)

112. Heavy Building Construction (3)
Problems and methods of solution in the construction of heavy buildings; site, excavations, foundations, framework, heavy timber, reinforced concrete, structural steel, masonry construction, and related elements. (field trips)

115. Materials of Construction (3)
Properties and functional applications of basic building materials: wood, steel, concrete, ceramics, plastics, adhesives, sealants. Recent developments in new materials and applications. (field trips)

116. Scheduling and Control (3)
Prerequisite: QM 60, senior standing. Critical path method; planning, scheduling, and control of construction projects including logic, time assignment and computation, analysis, replanning, diagramming practices, monitoring and updating, computer utilization; role of management. (field trips)

117. Construction Detailing (3)
Prerequisite: Ind A 143. Standard structural details for buildings constructed of wood, concrete, masonry, and steel. Graphic communication between architects, engineers, contractors. (field trips)

AUTOMOTIVE AREA

12. Basic Automotive Systems (3)
Design, construction and mechanical functions of automotive engines, fuel systems, electrical systems, power transmission, brakes, and wheel suspension; proper use and safety of tools and equipment.

120. Advanced Automotive Systems (3)
Prerequisite: Ind A 12, 52. Advanced study of automotive engines, electrical systems, automatic transmissions, brakes, and power transmitting mechanisms; sciences involved with internal combustion, electricity, hydraulics, pneumatics, energy conversion. (field trips)

122. Automotive Technical Problems (3)
Prerequisite: Ind A 12. Automotive air conditioning, body applications, diesel, fuels and lubricants technology, small horsepower engines and laboratory organization. (field trips)

124. Automotive Diagnosis and Correction (3)
Prerequisite: Ind A 12. Automotive testing, servicing and repair processes applied to engine, power transmission, and chassis components. (technical reports)

129. Automotive Systems Repair Procedures (3)
Prerequisite: Ind A 12. Technology of engine rebuilding, carburetor and electrical service, power transmission, brakes and wheel suspension, body work and tuneup. (technical reports)

CRAFTS AREA

34. Theatre Craft (3) (See Drama 34)

133. Industrial Crafts (2; max total 4)
Creative and recreational experiences in craft media including plastics, leather, wood, metal, enamels; historical, cultural, technological information.

134. Advanced Theatre Craft (3) (See Drama 134)

DRAFTING-DESIGN AREA

41. Applied Drawing (3)
Grammar and composition of drawing, sketching, lettering, orthographic projection, working drawings, auxiliary views, dimensioning, developments, pictorial drawing, and duplication.

42. Architectural Drawing (3)
Architectural drafting techniques and standards; progress from fundamentals to completing light construction working drawings, floor plans, elevations, details; application of city and county codes.

44. Descriptive Geometry (3)
Prerequisite: Ind A 41 or equivalent. Representation of geometrical magnitudes; relations between point, line, and plane; intersection and development of surfaces, architectural and engineering applications.

139. Advertising Design (3; max total 6)
Advertising and illustration problems from rough sketches to finished art work. Emphasis on good design and professional techniques. Preparation of art work for reproduction including overlays, art type, photo mechanical procedures and advertising production methods.

140. Machine Drawing (3)
Prerequisite: Ind A 41 or permission of instructor. Detail working drawings of machine parts, precision dimensions, limits and tolerances, threads, shop notes, parts lists, fasteners, assembly drawings, exploded views.

141. Design for Industry (3)
History and appreciation of design related to industrial design concepts; vocabulary of design terminology. Procedures to facilitate the development, selection, and organization of space, form and color.

142. Advanced Design for Industry (3)
Prerequisite: Ind A 141 or permission of instructor. Design principles; analysis of the design structure of forms, their variations, and derivations; color and three-dimensional projects.

143. Architectural Drawing (3)
Prerequisite: Ind A 41 or permission of instructor. Mechanical perspective, its theory and practical application to architectural and industrial problems.

144. Tool Design (3)
Prerequisite: Ind A 41, 140 or equivalent. Use of standard tool design handbooks, tooling standards, manufacturing process problems, properties of tooling materials, practical design for jigs and fixtures, tooling for automatic machines.

145. Technical Illustration (3)
Principles and practice of drawing and laws of light and shade; subject matter ranges from the simplest basic shapes to more complex real forms including renderings in pencil and opaque color of industrial products, interior, architectural, and automotive projects.

146. Materials of Product Design (3)
Prerequisite: Ind A 41 or permission of instructor. Origins, kinds, properties, and uses of materials of product design and development in modern industry; mechanical and nonmechanical functions of materials; experimentation with industrial materials of significance in the design of industrial products.

147. Rendering (3)
Prerequisite: Ind A 145 or permission of instructor. Theory and practice of rendering techniques for all phases of industrial and advertising design; from pencil sketches to composition stressing appeal and quick reading; in black and white, full color chalk, water color, and tempera.

148. Product Design (3; max total 6)
Prerequisite: Ind A 146 or permission of instructor. Fundamentals of product planning. Research analysis, synthesis, construction, and testing of solutions to problems in creative design of industrial products. Presentation and evaluation of research findings, drawings, and models created in relation to industrial and consumer needs.

149. Perspective for Industrial Design (3)
Theory of one, two- and three-point perspective, followed by extensive application involving industrial design objects. Laws of perspective and light and shade as applied to increasingly complex subject matter.

ELECTRICITY-ELECTRONICS AREA

52. Basic Electricity (3)
Introduction to electricity including fundamentals of electrostatics, alternating and direct current electrical circuits, electrical calculations, magnetics, circuit applications, electrical measuring and test equipment.

151. Elements of Digital Computers (3)
Electrical-electronics fundamentals and types of computer; elements of digital computers; digital computer systems and installations. (field trips)

152. Fundamentals of Electronics (3)
Prerequisite: Ind A 52. Basic electronic components and circuits including inductors, capacitors, alternating current circuits; resonance and filters; vacuum tubes and transistors; power supplies; measuring devices; oscillators; amplifiers.

153. Advanced Electronics (3)
Prerequisite: Ind A 152. Electronic systems and applications including basic transmitters, amplitude and frequency modulation transmitters and receivers; transistor applications; antennas; television. (field trips)

154. Industrial Electronics (3)
Prerequisite: Ind A 102, 153, 156, 158 or permission of instructor. Industrial electronics systems analysis; applications of electronic circuits and devices to industrial process and machine control. (field trips)

156. Fundamentals of Electrical Machines (3)
Prerequisite: Ind A 52, 101, 158, or permission of instructor. Power generation; energy conversion equipment; alternating and direct current motors and generators. (field trips)

158. Fundamentals of Electrical Power Distribution and Wiring (3)
Prerequisite: Ind A 52. Electrical power distribution equipment and systems; industrial and residential wiring circuits, devices and systems; local and national electrical codes. (field trips)

GRAPHIC ARTS AREA

60. Basic Graphic Arts (3)
Introduction to the graphic arts; hand composition, paper making, stereotype, rubber-stamp, thermography, marbling; experiences in relief printing methods; overview of entire printing industry. (field trips)

61. Typography (1)
For journalism students only. Printing processes, printing equipment, type faces, hand composition, paper, color printing, and format. (field trips)

160. Advanced Graphic Arts (3) (Former I A 163)
Prerequisite: Ind A 60 or equivalent. Techniques and processes employed by the graphic arts: advanced work in typographical design and layout, composition, imposition, presswork. Limited production printing. (field trips)

161. Advanced Photo Offset Lithography (3)
Prerequisite: Ind A 60. Techniques and processes employed by commercial and industrial photographic and offset lithographic industry: cold type layout and design, industrial photographic methods, offset lithography, photographic screen process printing, and limited production process printing. (field trips)

162. Graphic Arts Crafts (3)
Various processes and media used in graphic arts; creative and recreational aspects for the student; silk screen, linoleum block, intaglio, papermaking, thermographs, marbling, bookbinding, student projects. (field trips)

165. Typographical Layout (3)
Theory and practice utilized by the printing industry in designing, producing, and selling printed matter. Typographical principles, properties, elements, techniques, processes, and media, with aesthetic and psychological implications. (field trips)

166. Graphic Reproduction Techniques (3)
Prerequisite: upper division student. For persons interested in the field of buying, selling or producing printed material. Processes of reproduction; types of publications; media, materials and equipment; technical problems in layout; legal problems; yearbook and in-plant publication reproduction. (field trips)

167. Printing Economics (2)
Use of reproduction methods in graphic communication; methods of cost analysis, estimating, selecting, and evaluating the materials, media, and equipment of the printing industry. Methods and procedures used in printing management and related areas. (field trips)

METALS AREA

General Metalworking

70. Basic Metalworking (3)
Introduction to and exploration in various metal areas including sheet metal, bench metal, art metal, wrought iron, foundry and forging.

170. Advanced Principles of Metalworking (3)
Prerequisite: Ind A 70 or equivalent. Study and experience in the technological, scientific, and historical aspects of nonferrous metal casting, core-making; forging; principles of metal spinning.

Welding

71. Metallurgical Processes (2)
Fundamentals of metallurgy; properties and characteristics of metals; survey of metal welding processes, equipment, and procedures; introduction to destructive and nondestructive testing methods.

171. Advanced Metallurgical Processes (2)
Prerequisite: Ind A 71. Design of weldments; welding drafting and symbols; production processes and techniques; production economy.

Sheet Metalworking

173. Metal Fabrication Processes (3)
Sheet metal pattern drafting and layout applicable to parallel, radial, and triangulation methods using light gauge metals; individual problems in planning, using, and maintaining hand and machine tools.

Machine Tool Metalworking

74. Basic Machine Tool Metalworking (3)
Basic methods of machining metals, including drilling, turning and boring, milling, grinding, and shaping; measuring tools, precision measuring instruments, and layout; steel and its heat treatment.

174. Advanced Machine Tool Metalworking (3)
Prerequisite: Ind A 74. Advanced machining and tooling, special machine tools, and precision measuring instruments; laboratory experiences in use of ferrous and nonferrous metals, cast iron and semisteel castings.

175. Machine Tool Technical Problems (3)
Prerequisite: Ind A 74. Technical problems in design, layout, fabrication, machinability of materials, tooling, gearing principles, speeds and feeds, coolants related to modern manufacturing processes; installation, preventive maintenance, adjustment, repair of machine tools; specifications of materials and equipment.

176. Advanced Machine Tool Problems (3)
Prerequisite: Ind A 174. Advanced technical work in metals area; introduction to tool and die work; jig and fixture principles and practices; heat treatment; experimental work and technical reports

Metal Craft

178. Jewelry and Metalsmithing (3; max total 6) (Former Ind A 177, 179)
Design, fabrication techniques, and properties of materials as related to jewelry, gemology, and metalsmithing. Historical, contemporary, and creative emphasis. Designing and constructing articles of jewelry and hollow ware by hand and machine processes.

WOODWORKING AREA

80. Basic Woodworking (3)
Basic woodworking processes and materials; use and care of hand tools and portable electric tools; design, construction, and finishing of simple wood products; wood turning; basic operations on light woodworking machinery; basic information units in wood technology.

82. Wood Machining (3)
Prerequisite: Ind A 80 or permission of instructor. Development of proficiency in the operation and maintenance of modern woodworking machinery and spray finishing equipment; safety education, cutting principles and techniques, machine design and capabilities.

182. Advanced Wood Machining (3)
Prerequisite: Ind A 82. Construction of furniture, cabinet work and millwork design, construction details, production methods; analysis of cutting processes.

184. Woodworking Specialties (3)
Prerequisite: Ind A 82. Specialized activities related to field of woodworking; wood finishing and paint technology, upholstering, inlaying and veneering, advanced wood turning, furniture restoration.

185. Wood Technology (3)
Not open to students with credit in Ind A 186. Prerequisite: Ind A 82. Structure, characteristics, and physical properties of wood; strength values, grading, moisture relationships, fire resistance, wood destroying organisms, thermal insulation.

187. Wood Processing (3)
Not open to students with credit in Ind A 186. Prerequisite: Ind A 82. Lumber and wood products manufacturing; seasoning and preserving glue and glued products, laminated wood, plywood, fiber and particle boards. (field trips)

PROFESSIONAL COURSES

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

192. Industrial Arts Education in Secondary Schools (3)
Departmental prerequisite for student teaching. Prerequisite: S Ed 151. Principles, objectives, and recent trends in modern industrial arts instructional practices, including group observation.

194. Course Materials in Industrial Arts Education (2)
Prerequisite: Ind A 192. Development and use of written instructional materials; analysis and organization of course content for various industrial arts areas.

196. Graphic Communications (2)
Preparation and use of instructional aids, including models, mockups, cutaways, charts, instructional films, slides, overlays; photographic processes; planning, construction, classroom demonstration and evaluation.

198. Technical Report Writing (2)
Prerequisite: senior standing in industrial technology. Technical writing for the industrial technologist; preliminary organization and development of the senior problem.

199. Senior Problem in Industrial Technology (2)
Prerequisite: Ind A 198, permission of instructor. Approved problem or research project in the area of the student's option and emphasis.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

224T. Professional Topics in Industrial Education (2–3; max total 6 on master's degree with no area repeated)
Advanced study in professional industrial education; administration, supervision, vocational guidance, economic, and sociological implications.

225. Seminar on Philosophy of Industrial Arts Education (2) (Former IA 224.1)
Philosophy of industrial arts education within a democratic, industrial society; objectives of industrial arts education, and relationships to other subject areas.

226. Seminar on Innovative Programs in Industrial Arts (2) (Former IA 224.3)
Study of selected innovative and experimental programs in industrial arts; philosophic and curricular implications, recent developments and trends.

227. Seminar on History of Industrial Education (2) (Former IA 224.4)
Development of industrial education in the United States; European influences, philosophical concepts, issues, leaders, movements, and trends.

228. Evaluation in Industrial Education (3) (Former IA 224.5)
Techniques and philosophy of evaluation in industrial education; types of test items, item analysis, and interpretation of test results; evaluation of research, facilities, textbooks, and evaluative criteria.

270. Technical Problems (2-3; max total 6 if no area repeated)
Technical work in selected areas; research under supervision of instructor.

280. Problems in Industrial Arts Research (2)
Seminar in research procedures in the industrial arts; basic bibliography, research form and method.

281. Research Design in Industrial Education (3) (Former IA 224.6)
Research formats and applied experimentation techniques; critical path analysis and program evaluation review techniques.

284T. Topics in Industrial Technology (2-3; max total 9 on master's degree if no area repeated)
Advanced study in technical areas; current industrial practices, developments, and trends related to design, materials, and processes.

285. Planning Industrial Arts Facilities (2)
Planning and organizing various types of school shops; architectural considerations, selection and specifications of equipment. (field trips)

286. Safety and Related Problems (2)
Research and study of safety problems in industrial education; planning and evaluation of specific safety programs.

287. Planning and Organizing Industrial Arts Curriculum (3)
Prerequisite: Ind A 192, 194 or S Ed 153, or permission of instructor. Modern industrial arts curriculum; organization and management; recent trends concerned with equipment, supplies, content, safety, and methods.

288. Seminar in Industrial Arts and Technology (2-3; max total 6 on master's degree)
Advanced individual and group study of selected problems: organizational relationships, effective communication of ideas, technological trends and developments, economic and social considerations.

290. Independent Study (1-3; max see reference)
See *General Information—Independent Study.*

299. Thesis or Project (2-4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System.*)

341. Problems in Industrial Arts (2-3; max total 6 if no area repeated)

JOURNALISM DEPARTMENT

Professors: Duke (Chairman), A. Margosian, Shepard
Associate Professors: Ingenthron, Molen, Rehart, J. Tucker
Assistant Professors: Dill, Gotliffe
Part-time: Masumoto, Rintoul, Temple

The program leading to a bachelor of arts degree in journalism prepares students for communications and editorial employment with newspapers, magazines, radio and television stations, and for related types of work in public relations, industrial journalism, technical journalism, general publishing, advertising, and teaching. A broad general education is required in addition to special study in journalism. Majors are advised to take electives in various areas and keep journalism units near the minimum required for a major. An interdisciplinary graduate program for the master of arts degree in Mass Communication is jointly offered by the journalism and radio-televison faculties. See *School of Graduate Studies* and *Graduate Bulletin.*

The Journalism Department is accredited by the American Council on Education for Journalism. The news-editorial sequence is specifically accredited by the Council. The department is a member of the American Association of Schools and Departments of Journalism and the American Society of Journalism School Administrators.

MAJOR

In preparation for the field of journalistic communication, students may follow a program in one of several sequences. The department offers study in news-editorial, advertising, public relations, radio-television news communication, magazine journalism, and photocommunication. All of the sequences are related by fundamental skills, and each major requires a basic core program. The sequences, however, vary in their individual requirements, and students who wish to specialize in these areas must complete those courses listed under the specified headings.

The journalism major consists of 36 units, 24 of which must be in upper division courses. In addition to the specific journalism courses, each sequence has requirements which must be courses other than those in general education. All majors also require completion of a course in English composition with a minimum grade of C.

REQUIRED CORE PROGRAM *Units*

Jour 1, 8, 110, 114 12

News-Editorial

Jour 110 (3 additional units), 126, 184, 188 12
Additional journalism courses approved by department 12

24

Additional Requirements (not used for general education; excluding journalism): Ind A 61, 12 units approved by department.

Advertising

Jour 145, 146, 155, 175 12
Additional journalism courses approved by department 12

24

Additional Requirements (not used for general education; excluding journalism): Ind A 61, 6 units in sociology and psychology, 6 units in approved subject field.

Public Relations *Units*

Jour 113, 173, 185 or 186, 193	12
Additional journalism courses approved by department	12
	24

Additional Requirements (not used for general education; excluding journalism): Ind A 61, 12 units approved by department, including 6 units in a specific area.

Radio and Television News Communication

Jour 128, 129, 130	9
R-TV 40	3
Additional journalism courses approved by department	12
	24

Additional Requirements (not used for general education; excluding journalism): 12 units approved by department, including 6 units in radio-television.

Magazine Journalism

Jour 106, 124, 132, 186	12
Additional journalism courses approved by department	12
	24

Additional Requirements (not used for general education; excluding journalism): Ind A 61, 12 units approved by department.

Photocommunication

Jour 17, 116, 117, 118, 187	13
Additional journalism courses approved by department	11
	24

Additional Requirements (not used for general education; excluding journalism): IA 61, R-TV 129, 170; 6 units from Art 30, 70, 41, E Ed 135.

MINOR

A minor in journalism consist of 20 units including a required core of 9 units and 11 units in one of the areas of concentration.

REQUIRED CORE PROGRAM *Units*

Jour 8, 110, 114	9

News-Editorial

Jour 126, 188	6
Journalism electives	5
	11

Advertising

Jour 145, 155	6
Journalism electives	5
	11

Photocommunication

Jour 17, 117	6
Journalism electives	5
	11

Public Relations	*Units*
Jour 113, 173	6
Journalism electives	5
	11

Radio and Television News Communication	
Jour 128, R-TV 40	6
Journalism electives	5
	11

MASTER OF ARTS DEGREE

The graduate program leading to the master of arts degree in Mass Communication with emphasis in the print media is based upon undergraduate work in journalism. For requirements, consult the department chairman; for courses see *School of Graduate Studies—Interdisciplinary Courses.* Detailed information about the graduate program at Fresno State may be obtained from the office of the School of Graduate Studies.

CREDENTIAL PROGRAM

For information on the current credential program consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area II:* Jour 182, 184. *Area V:* Jour 1, 2, 185, 186. (See *General Education—Courses*)

COURSES

JOURNALISM (Jour)

1. Mass Communications (3)
Survey of the mass media of communication, including newspapers, magazines, radio and television; related agencies and fields of communicative enterprise, such as press associations, feature syndicates, advertising, and public relations.

2. Interpreting Current Events (2)
Analysis, from the reader's point of view, of current information in news media; what constitutes news, breadth and depth of news coverage of various media, reliability of sources, influence of policy, methods of emphasis, objectivity and coloration.

8. Reporting (3)
Prerequisite: Engl 1, sophomore standing. Preparation of varied stories used by newspapers; analysis of news sources; techniques of interviewing; problems encountered by reporters; ethical and legal considerations; coverage of some campus and community functions. (2 lecture, 2 lab hours)

17. Introductory and Publications Photography (3) (Former Jour 17A)
Survey and instruction in beginning publications photography; use of camera equipment for black-and-white pictures; pictures taken and films and prints processed in laboratory sessions. (2 lecture, 3 lab hours)

106. Industrial Journalism (2)
Survey and analysis of internal and external company publications; of association; and of industrial and trade publications.

109. Contemporary Problems of the American Press (3)
Prerequisite: Jour 8 or permission of instructor. Advanced reporting problems; news policies and ethics; specialized reporting.

110. Advanced Reporting (3; max total 6)
Prerequisite: Jour 8. Practice in handling advanced news writing and reporting assignments in the environment of a newsroom. Journalism Department newspaper used for laboratory purposes. (12 hours arranged)

112. School Public Relations (3) (Same as AS 112)
Organization and analysis of a public relations program for elementary and secondary schools.

113. Public Relations (3)
Development of public relations practice; principles and methods; application in business, education, and other fields.

114. Editing of Publications (3)
Prerequisite: Jour 8. Editing copy; writing headlines; using type effectively; handling telegraph copy; making up newspapers, lab use of department newspaper. (2 lecture, 2 lab, 3 hours arranged)

115. Copyreading (1; max total 2)
Prerequisite: Jour 114. Individually supervised editing of copy and writing headlines. College newspaper used as a laboratory. (hours arranged)

116. Photo Editing (2)
Study of the use and potential use of photographs in various types of publications. Instruction in how to identify and to obtain quality photographs for publication.

117. Advanced Press Photography (3)
Prerequisite: Jour 17 or permission of instructor. Use of news cameras for photographic reporting; evaluation and preparation of pictures for publication; field and laboratory experience in flash and extension lighting, filters; advanced uses and processing of high speed films, efficient processing methods. (2 lecture, 3 lab hours)

118. Advanced Photojournalism (2; max total 4)
Prerequisite: Jour 17 or permission of instructor. Field and laboratory work in the production of the picture story and essay; magazine and news reporting on assignment; press and investigative photography. (1 lecture, 3 lab hours)

120. Newspaper Workshop (2; max total 4)
Prerequisite: Jour 110. Practice in comprehensive, depth reporting and executive news work; use of Journalism Department newspaper for laboratory purposes. (4 lab hours)

124. Magazine Feature Writing (3)
Writing and marketing varied kinds of feature material used by magazines, Sunday newspaper supplements, and syndicates.

126. Interpretative Writing (3)
Critical analysis of structure and content of newspaper editorials; practice in writing editorials and interpretative articles; make-up of editorial pages; study of columns, cartoons, and special editorial features.

128. Radio and Television News Writing (3)
Prerequisite: Jour 8 or permission of instructor. Gathering, writing, editing news for radio and television.

129. Field Work in Broadcast News (3)
Prerequisite: Jour 8, 128, and permission of instructor. Gathering, writing, and editing broadcast news in live studio situations.

130. Problems of Broadcast Journalism (3)
Prerequisite: upper division standing. Sociological and journalistic study, including evaluation of historical development, legal problems, and traditional and contemporary criticism of broadcast journalism.

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131. Principles of High School Journalism (2)
Instruction in methods of teaching high school journalism and advising high school newspapers and yearbooks.

132. Magazine Production (2; max total 4)
Layout practice, writing of copy, and organization of magazines. College publications used for laboratory purposes (4 hours arranged)

142. Radio and Television News Broadcasting (3) (See R-TV 142)

145. Advertising Procedures (3) (Former Jour 145A)
Overview of all aspects of the field of advertising. Study of history, agent-client relationships, all media, relationship to the behavioral sciences, production of copy and layouts, and advertising legislation and responsibility.

146. Newspaper Advertising Staff (3; max total 6)
Prerequisite: Jour 145 or permission of instructor. Newspaper advertising staff designed to give students practice in selling and servicing accounts, creating and producing advertisements: department paper used as a laboratory.

155. Print Advertising Copy Writing (3)
Prerequisite: Jour 145. Not open to student with credit in Jour 145B. Print media advertising copy writing and design. Print media in relationship to advertising and society.

160. Advertising Media (3)
Prerequisite: Jour 145. Analysis of strengths and weaknesses of all media and their relationship to advertising. Market research, media research and the effect of the medium on the message.

165. Broadcast Copywriting (3) (Former Jour 147)
Prerequisite: Jour 145 and 155 or permission of instructor. Broadcast media in relationship to advertising and society. Writing and production of commercials for radio and television.

173. Public Relations: Programs and Problems (3)
Prerequisite: Jour 113 or permission of instructor. Development, assessment, and evaluation of public relations in business, education, philanthropy, and other field practice.

175. Advertising Campaigns (3)
Prerequisite: Jour 145, 155, or 160. Background, planning, and preparation of advertising campaigns. Term campaign, in advertising agency groups, with client-agency setup; analysis of campaigns and their effectiveness.

181. Laws of Communication (3)
Libel, right of privacy, right of confidence, contempt by publications, property rights in manuscripts, infringement, copyright, postal laws.

182. The Press and World Affairs (3)
Not open to students with credit in Jour 102. The role of the international press in collecting and disseminating national and foreign news.

184. History of Journalism (3)
Not open to students with credit in Jour 104. Historical backgrounds of American press; development from colonial to modern times; newspapers and allied media as political and social forces.

185. Mass Media and Social Control (3)
Not open to students with credit in Jour 149. Theories of social control as they are utilized in the mass media. Special emphasis on various propaganda techniques as practiced in times of war and peace.

186. Media of Communication (3)
Not open to students with credit in Jour 150. Impact of mass media on society. Includes problems, contributions, criticisms and contemporary issues of the mass media.

187. Photocommunication Projects (3; max total 6)
Prerequisite: Jour 17, 117 or equivalent. Designed to allow students to pursue in-depth and individualized study and practice in advanced photographic skills related to the field of photocommunication; to include special lighting effects, posing, advanced darkroom skills, action photography, candid photography and color.

188. Reporting of Public Affairs (3)
Not open to students with credit in Jour 108. Prerequisite: Jour 8 or permission of instructor. Methods of reporting the courts and municipal, county, state, and federal governments.

189. Reporting Public Opinion (3)
Not open to student with credit in Jour 185 prior to fall 1972. Study of the nature, effects, and measurement of U.S. public opinion; various theories on relationships between voter attitudes and public opinion polls; the practice of selected polling techniques.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

193. Field Work in Public Relations (3)
Prerequisite: Jour 8, 113. Open only to journalism majors with permission of instructor. Supervised work experience in public relations; analyses in periodic meetings and reports.

197. Photocommunication Practice (2–4; max total 4)
Prerequisite: permission of instructor. Internship on regional newspapers, television stations, advertising agencies, or other media which use photocommunication. Reports made regularly to instructor.

198. Newspaper Practice (2–4; max total 4)
Prerequisite: permission of instructor. Internship on regional newspapers and radio and television stations. Reports made regularly to instructor.

199. Advertising Practice (2–4; max total 4)
Prerequisite: Jour 145, 155, 160 and permission of instructor. Internship in advertising departments of regional mass media and with advertising and public relations agencies. Reports made regularly to instructor.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

See *Mass Communication, School of Graduate Studies—Interdisciplinary Courses.*

IN-SERVICE COURSES

(See *Course Numbering System.*)

353. Topics in Journalism (1–3; max total 9 if no topic repeated)

MUSIC DEPARTMENT

Professors: Coker (Chairman), Bakkegard, Bob L. Bennett, Dempster, Gillis, Howland, Irwin, Lywen, J. H. Martin, R. C. Rea, Winter

Associate Professors: A. Huff, Hurst, P. Lorenz, Renzi, Skei, Sutherland

Assistant Professors: Bates, Fortner, Gilbert, Heard, Hurst, Mullen

Lecturers: Riley, Standring

Part-time: Glassock, Keene, E. Lorenz, Niblack, R. A. Rea

The Music Department provides (a) undergraduate instruction in music for those planning professional careers as performers and composers as well as those preparing for advanced degrees in performance, composition, and musicology; (b) preparation for the teaching credential programs in or involving music; (c) graduate training for students planning professional and academic careers or seeking professional growth as teachers in junior colleges or other school systems; (d) broad acquaintance with musical art for the layman and nonmusic major. Two degree programs are offered: the bachelor of arts and the master of arts, each with concentrations in performance, composition, musicology, or music education.

BACHELOR OF ARTS DEGREE

Each student seeking a bachelor of arts degree with a major or minor in music must fulfill all the requirements listed under *General Degree Regulations, General Education,* and *Other Departmental Requirements.*

MUSIC MAJOR *Units*

Music 40, 41, 161A-B, 162A-B 18
Complete one of the following options 26

Option I. *Preparation for performance, composition, musicology and other nonteaching careers in music.*

Pass piano proficiency test; 10 units in Music 42, 43; Music 141; concentrations a, b, or c below.

a. Performance: 8 units in Music 31–131 through 39–139 (instrument or voice) with advanced standing; 5 units in Music 142, 143, 145, 146, 147, 148, 153, 154.
b. Composition: Music 145, 9 units in 147, 148, 149, 1 unit in Music 190.
c. Musicology: Music 142, 147, 160T, 3 units in Music 76T–176T, 1 unit in Music 190.

Option II. *Preparation for a standard teaching credential with secondary specialization.*

Pass piano proficiency test; Music 156, concentration a or b below:

a. Teaching general music and music appreciation: 8 units in Music 31–131 through 39–139 with 4 units advanced standing; Music 119T, Theory and Appreciation; 12 units in Music 76T–176T, 1 unit in Music 190.
b. Teaching Performing Organizations. Vocal: 4 units in Music 36–136 and 4 units in 39–139 (Requirement in piano and voice: 2 semesters in each area with at least 4 units advanced standing in one of the two areas.); Music 42, 43, 141 or 143 or 145, 153; Music 119T, Voice and Chorus.
c. Instrumental: 8 units in Music 31–131 through 35–135 (at least 4 units of advanced standing in major performance medium); Music 42, 43, 145, 146, 154; pass proficiency tests in brass, woodwind, percussion, and string instruments.

Option III. *Preparation for a standard teaching credential with elementary specialization.*

Pass piano proficiency test; 8 units in Music 36–136 and 8 units in 39–139 with 4 units advanced standing in a performance area (piano, voice, instrument); 4 units in Music 119T, Children's Music, Voice and Chorus, Theory and Appreciation; Music 155; 3 units in Music 76T–176T.

Recommended elective: Phys 55

OTHER DEPARTMENTAL REQUIREMENTS

1. Each student majoring in music must declare an area of concentration (i.e., an instrument, voice, composition, musicology, or music education).
2. At the close of his first semester, each student must pass the preliminary jury examination in his area of concentration before being permitted to continue his major. A further examination must be passed for advanced standing.
3. A proficiency test on piano must be taken at least one year before graduation by each student whose concentration is in performance, composition, musicology, or music education. Those failing the test must take Music 36–136 (piano) until the proficiency test is passed.
4. During the orientation period prior to their first registration, all transfer students take a placement test.
5. Every semester each student must participate in a major performing organization: voice students in Concert Choir; string students in orchestra or band; woodwind, brass and percussion students in band or orchestra; and others in any of the foregoing organizations. Two semesters of keyboard chamber music may be substituted by piano majors (Option I) in lieu of two of the required four semesters of participation in major activities. After four semesters of credit in the above organizations, other performing organizations may be substituted to meet this requirement. The student will normally enroll in the same organization both semesters of an academic year.
6. Participation in all rehearsals and performances of the performing organizations (Music 3–103 through 27–127 series) for which the student registers must take precedence over any conflicting activity.
7. Students in Music 31–131 through 39–139 series courses will appear in student recitals when assigned.
8. Each student majoring in music must attend the departmental recitals on Thursday at 1:00 p.m.
9. A senior project is required of each student during his final year. For those whose area of concentration is voice or an instrument the project will be a public recital, of which at least one-half must be performed by memory. A student concentrating in composition will compose a work of major proportions during his final year and will either perform or supervise a prepared reading of the work. Those concentrating in musicology or music education will present an original research paper, which may also require special performance. The senior project must be approved in advance of preparation by the instructor concerned and the department chairman. On presentation, the project must be accepted by the designated faculty committee before the candidate may be recommended for the degree.

MUSIC MINOR

The minor in music requires completion of at least 20 units of music courses, 6 units of which must be upper division. The program must be approved by the department adviser and the department chairman. Required units usually include: Music 9 (or 40 and 41); 6 units of Music 31–131 through 39–139; 7 units of Music 76T–176T. In addition, students minoring in music must enroll in Music 103 through 127 each semester of the junior and senior years.

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in music is based upon the undergraduate major in music at Fresno State or the equivalent. For specific requirements, consult the chairman of the departmental graduate committee and see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies. For general requirements, see *School of Graduate Studies.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area III:* Music 4–104, 6–106 through 27–127, 9, 31–131 through 35–135, 37–137, 38–138, 76T, 176T. *Area V:* Music 40, 41, 161A-B, 162A-B. General education listings in music are offered on an optional basis of either a letter grade or pass-withdrawal. Music majors and minors must enroll for a letter grade in all music courses.

COURSES

MUSIC (Music)

PERFORMING ORGANIZATIONS

All performing organization courses may be repeated for credit and are open to both lower and upper division students.

The courses below include the technical, stylistic, and aesthetic elements of musical literature; rehearsal and public performance.

3-103. Concert Choir (2) (Former Music 101.1)

4-104. Chamber Singers (1–2) (Former Music 101.2)

5-105. Opera Workshop (1–2) (Former Music 101.3)

6-106. Collegiate Chorale (1) (Former Music 101.4)

7-107. Men's Chorus (1) (Former Music 101.5)

8-108. Women's Chorus (1) (Former Music 101.6)

11-111. Brass Ensemble (1) (Former Music 102.1)

12-112. Percussion Ensemble (1) (Former Music 102.2)

13-113. String Ensemble (1) (Former Music 102.3)

15-115. Woodwind Ensemble (1) (Former Music 102.4)

16-116. Keyboard Ensemble (1) (Former Music 102.5)

18-118. Orchestra (2) (Former Music 102.6)

20-120. Band Workshop (1–2) (Former Music 102.7)

21-121. Concert Band (1) (Former Music 102.8)

22-122. Jazz Workshop (1–2) (Former Music 102.9)

23-123. Contemporary Ensemble (1) (Former Music 102.10)

25-125. Marching Band (1–3) (Former Music 102.11)

26-126. Rock Band (1) (Former Music 102.12)

27-127. Collegium Musicum (1)

100T. Topics in Vocal or Instrumental Organizations (1–2) (Former Music 101T–102T)

Technical, stylistic, and aesthetic elements of musical literature; rehearsal and public performance.

130T. Topics in Performance (1–2); repeatable for credit)

Special studies in vocal or instrumental music, including topics such as accompanying, electronic instruments, mixed chamber music, lyric diction.

INSTRUMENTAL AND VOCAL LESSONS

The courses listed below include studies in technical, stylistic, and aesthetic elements of artistically performing repertory from the standard literature of etudes, solo, chamber, and large ensemble music. Repeatable for credit.

31-131. Brass (2) (Former Music 110.1)

32-132. Percussion (2) (Former Music 110.2)

33-133. Strings (2) (Former Music 110.3)

35-135. Woodwinds (2) (Former Music 110.4)

36-136. Piano (2) (Former Music 110.5)

37-137. Harp (2) (Former Music 110.7)

38-138. Organ (2) (Former Music 110.8)

39-139. Voice (2) (Former Music 110.10)

THEORY AND COMPOSITION

40. Comprehensive Musicianship I (5) (Former Music 4.1, 4.2, 40A-41A)
Prerequisite: Music 9 or the ability to read music. Fundamentals of music. Species counterpoint in two and three voices. Development of aural skills correlative to written work.

41. Comprehensive Musicianship II (5) (Former Music 4.2, 4.4, 40B, 41B)
Prerequisite: Music 40. Harmonic and contrapuntal practice of the 17th and 18th centuries, with development of pertinent written and aural skills.

42. Comprehensive Musicianship III (5) (Former Music 14.1, 14.2, 42A, 43A)
Prerequisite: Music 41. Continuation of Music 41, with emphasis on 19th century harmonic and contrapuntal practice. Introduction to analytic-reductive techniques.

43. Comprehensive Musicianship IV (5) (Former Music 14.3, 14.4, 42B, 43B)
Prerequisite: Music 42. Survey of the compositional practice of the 20th century, with analysis of selected works. Development of more advanced aural and written skills.

140T. Topics in Theory and Composition (3)
Prerequisite: Music 40, 41, 42, 43. Technical, stylistic, and aesthetic elements of theory and composition.

141. Seminar in Modal Counterpoint (3) (Former Music 114.1)
Prerequisite: Music 42, 43. Polyphony of the 15th and 16th centuries; analysis and composition of melodic lines, simple counterpoint, types of imitation; writing motets with text in three or more parts.

142. Seminar in Canon and Fugue (3) (Former Music 114.2)
Prerequisite: Music 42, 43. Polyphony of the 17th and 18th centuries; analysis and composition of melodic lines, imitative, strict and invertible counterpoint, canon and fugue.

143. Seminar in Contemporary Counterpoint (3) (Former Music 114.3)
Prerequisite: Music 42, 43. Polyphony of the 20th century; analysis and composition of melodic lines and counterpoint using modern procedures.

145. Orchestration and Band Arranging (3; max total 6) (Former Music 124.1)
Prerequisite: Music 42, 43. Problems in scoring for instrumental ensembles; idiomatic writing for instruments singly and in combinations.

146. Band Pageantry (2) (Former Music 124.2)
Prerequisite: Music 42, 43, 145; 120 or 121 (concurrent). Practical and creative aspects of producing musical shows and marching formations for athletic events, parades, and public ceremonies.

147. Seminar in Exercises in Composition (3) (Former Music 134.1)
Prerequisite: Music 42, 43 or permission of instructor. Creative writing for voices or instruments in small forms with specified techniques of the 20th century.

148. Seminar in Advanced Composition (3; max total 9) (Former Music 134.2)
Prerequisite: Music 42, 43, 147 or permission of instructor. Seminar in original composition of a thoroughly contemporaneous nature in media, forms, and styles of student's choice.

149. Jazz Composition and Arranging (3) (Former Music 134.3)
Prerequisite: Music 42, 43 or permission of instructor. Special problems in composing and arranging for jazz ensembles.

153. Seminar in Choral Conducting (3) (Former Music 144.1)
Prerequisite; Music 42, 43. Projects related to directing choral ensembles of varying size and levels of competence; conducting techniques; achieving tone quality and balance; diction; score reading; rehearsal techniques, ensemble organization and management.

154. Seminar in Instrumental Conducting (3) (Former Music 144.2)
Prerequisite: Music 42, 43. Projects related to directing instrumental ensembles of varying size and levels of competence; conducting techniques; score reading; rehearsal techniques, ensemble organization and management.

MUSIC HISTORY AND LITERATURE

76T-176T. Topics in Music Appreciation (3); repeatable for credit)
Listeners' guide to music appreciation; structure and expression, formal designs, stylistic tendencies; musical literature; analysis of representative works. Topics include: Choral, Wind, Brass, and Percussion, String, Chamber, Keyboard, Orchestral, Vocal Recital, Operative, Avant-Garde, Folk and Ethnic, Jazz and Rock, and Musical Theatre.

160T. Topics in Music History, Literature and Appreciation (3)
Prerequisite: Music 161A, 162A or permission of instructor. Study of selected musical genres, composers, and other specialized topics.

161A. Seminar in Musical Literature I (3) (Former Music 117.1)
Prerequisite: Music 40, 41, or permission of instructor; Music 162A (concurrent). Individual research projects and reports on music from the early Middle Ages to approximately 1750.

161B. Seminar in Musical Literature II (3) (Former Music 117.3)
Prerequisite: Music 40, 41, or permission of instructor; Music 162B (concurrent). Individual research projects and reports on music from approximately 1750 to present.

162A. Practicum in Musical Literature I (1) (Former Music 117.2)
Prerequisite: Music 40, 41, or permission of instructor; Music 161A (concurrent). Intensive study of selected compositions from the early Middle Ages to approximately 1750.

162B. Practicum in Musical Literature II (1) (Former Music 117.4)
Prerequisite: Music 40, 41, or permission of instructor; Music 161B (concurrent). Intensive study of selected compositions from approximately 1750 to the present.

163. Women in Music (3) (Same as W S 163)
Historical study of women in music; special attention given to contemporary women in all areas of music including the concert world, folk, jazz, rock, and music education.

MUSIC EDUCATION

9. Introduction to Music (3)
Not open to music majors or students with credit in Mus 40. Theory necessary for the reading, playing and understanding of music by the layman and the elementary credential candidate.

109. Piano in the Classroom (2; max total 4)
Not open to music majors. Class instruction in piano for elementary credential candidates and teachers working on graduate degrees.

119T. Topics in Pedagogy (2; max total 16)
Prerequisite: Music 40, 41. Principles, playing and teaching procedures, and materials for teaching specialized music topics in the elementary school, high school, and junior college. Topics include: Brass, Percussion, Strings, Woodwinds, Keyboard Instruments, Children's Instruments, Voice and Chorus, Theory and Appreciation.

155. Seminar in Children's Music (3) (Former Music 129.1)
Prerequisite: Music 40, 41 for students majoring in music; Music 9 for others. Individual research on the place and functions of music in the elementary school curriculum; selection, discussion, and analysis of musical materials including state texts; planning activities that enable children to develop aesthetic sensitivity, musical skills, and understanding.

156. Seminar in Music for Youth (3) (Former Music 129.2)
Prerequisite: Music 40, 41 for students majoring in music; Music 9 for others. Individual research on the place and functions of music in the secondary school curriculum; selection, discussion, and analysis of musical materials; planning activities that enable adolescents to develop musical skills and understanding.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191. Readings in Music (1–3)
Prerequisite: permission of instructor. Readings in depth and discussions in individual conferences; subject to be selected by student and his adviser. May be preliminary research in connection with thesis topic.

GRADUATE COURSES

(See *Course Numbering System—Definition and Eligibility*)

205. Seminar in Analysis, I: Tonal Music. (3) (Former Music 204)
Principles of musical form and analysis as applied to representative works of the eighteenth and nineteenth centuries.

206. Seminar in Analysis, II: Nontonal Music. (3) (Former Music 204)
Development of a descriptive vocabulary suitable for the music of the twentieth century, with special reference to works by Schoenberg, Berg, Webern, and selected American composers.

210. Studies in Performance (2; max total 6)
Open only to master's degree students majoring in performance. Prerequisite: Music 220 and permission of department chairman. Individually directed studies in performing or conducting instrumental or vocal music; historical and theoretical interpretation applied in preparation for public recitals and concerts of works from the standard literature of all periods in the student's major performance area.

214T. Seminar in the History of Music Theory. (3; max total 9)
Prerequisite: Music 220 or permission of instructor. Critical survey of a selected topic in the history of music theory. Topics include: Theories of Harmony, Theories of Musical Form, History of Musical Notation, Musical Aesthetics, Contemporary Theoretical Systems.

217. Seminar in Musicology (3; max total 9) (Former Music 217T)
Prerequisite: Music 220, the equivalent, or permission of instructor. Intensive critical and analytical study of the music of selected composers and genres.

219T. Seminar in Music Education (3; max total 9 if no course repeated)
Prerequisite: Music 155, 156 or equivalents and permission of the instructor. Topics of special concern to the teacher or administrator. Individual research projects and discussion of problems in the area of literature, philosophy, and practices of teaching, administration, and curriculum planning.

220. Seminar in Research Methods and Bibliography (3)
Prerequisite: Music 161A, B, 162A, B, or equivalent. Bibliography, sources, and research techniques necessary for graduate study in music. Individual projects and research. Required of all students working for the master's degree in music.

227. Seminar in Medieval Music (3)
Prerequisite: Music 220, the equivalent, or permission of instructor. Study of selected topics from plainchant to approximately 1400 A.D.

234. Seminar in Composition (3; max total 9)
Prerequisite: Music 141, 142, 204, and permission of instructor. Independent creative writing with contemporary techniques of an extended work equivalent in substance to a sonata, cantata, or other composition of major proportions.

237. Seminar in the Music of the Renaissance (3) (Former Music 217.1)
Prerequisite: Music 220, the equivalent, or permission of instructor. Critical and analytical study of the historical sources, selected works and composers of the period from approximately 1425 to 1600 A.D.

247. Seminar in the Music of the Baroque (3) (Former Music 217.1)
Prerequisite: Music 220, the equivalent, or permission of instructor. Critical and analytical study of the historical sources, selected works and composers of the period from approximately 1600 to 1750 A.D.

257. Seminar in the Music of the Classic and Early Romantic Eras (3) (Former Music 217.2)
Prerequisite: Music 220, the equivalent, or permission of instructor. Critical and analytical study of the historical sources, selected works and composers of the period from approximately 1750 to 1850 A.D.

267. Seminar in the Music of the Late Romantic and Contemporary Eras (3) (Former Music 217.3)
Prerequisite: Music 220, the equivalent, or permission of instructor. Critical and analytical study of the historical sources, selected works, and composers of the period from approximately 1850 A.D. to the present.

277. Seminar in American Music (3) (Former Music 217.4)
Prerequisite: Music 220, the equivalent, or permission of instructor. Critical and analytical study of the historical sources, selected works and composers in the United States from 1620 A.D. to the present.

287. Seminar in Interpretation of Earlier Music (3)
Prerequisite: Music 220, the equivalent, or permission of instructor. Historical study of performance practices from the Middle Ages to the early classic era. Individual research projects and class discussions centered on primary theoretical and musical sources.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

291. Readings in Music (1–3)
Prerequisite: permission of instructor. Readings in depth and discussions in individual conferences; subject to be selected by student and his adviser. May be preliminary research in connection with thesis topic.

298. Graduate Recital (1, max total 3)
Prerequisite: permission of department chairman.

299. Thesis or Project (2–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

307. Musical Instrument Repair (1; max total 3)

309T. Workshop: Vocational and Avocational Music Topics (1–2)

Topics such as: New State Music Textbooks, Elementary School Classroom Folk Music and Dancing, Piano Teachers' Workshop, Brass Music, Creative Approaches to Classroom Music, Exploring Sound and Music.

NURSING DEPARTMENT

Professors: Patterson (Chairman), Bailey, Baumgartner, Bergey, Gardner, Nishio

Adjunct Professors: Glenn, Peters, Robison

Associate Professors: C. Avent, Chang, M. Davis, Greene, Haddad, Hansen, H. Hogan, Husson, Kay, Knight, Krell, Nelson, Rabago, Sia, Sommer, Stittich, Welch

Assistant Professors: Bohnert, Kindell, McClintic, Schmitz, Steffes, Yamamoto, Viau

Lecturers: Bedrosian, Boffman, Chakalozian, Hefferin, Tetzlaff, Thorburn

Part-time: Ferguson, M. Hill, Moss, Williams

The Nursing Department offers a bachelor of science degree program with a major in nursing. The graduate will be eligible to take the examination required by the California State Board of Nursing Education and Nurse Registration for licensure to practice as a registered nurse. The program qualifies the graduate for the California certificate in public health nursing and provides a foundation for graduate study. It also provides an opportunity for the registered nurse to fulfill the requirements for the bachelor of science degree in nursing. At the graduate level the department offers a master of science degree in nursing. Both the baccalaureate and master's degree programs are accredited by the National League for Nursing and the California State Board of Nursing Education and Nurse Registration.

COOPERATING HOSPITALS AND AGENCIES

The Nursing Department utilizes the resources of Bel Haven Convalescent Hospital, Clovis Memorial Hospital, Fresno Community Hospital, Fresno Convalescent Hospital, Northside Psychiatric Hospital, Sierra Hospital, St. Agnes Hospital, Valley Children's Hospital, Veteran's Administration Hospital, Kings View Community Mental Health Center, Valley Medical Center, Fresno County Health Department, Tulare County Health Department, Madera County Health Department, and Kings County Health Department. These facilities are used for clinical nursing laboratory experience.

BACHELOR OF SCIENCE DEGREE WITH MAJOR IN NURSING

The bachelor of science degree curriculum consists of 130 units, 60 of which are in the nursing major. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials)*. Application for admission to the nursing major must be submitted to the Department of Nursing; SAT or ACT scores must be included in the application. Applicants will be screened by the department during the semester preceding the entrance date. Specific health criteria must be met. Science prerequisites must be completed with a minimum grade of C in each course; a minimum GPA of 2.25 is also required. Students will be admitted to the college in the prenursing program prior to acceptance into the nursing major.

Criteria for retention and progression in the program include a minimum grade of C in each nursing course; a 2.5 GPA is required for advancement to senior standing. A 3.0 GPA is required to take two clinical courses concurrently.

Students must carry malpractice insurance and must provide for their transportation for clinical experiences. Completion of requirements for the nursing major may take more than four years. For application form and further information write to the Department of Nursing, California State University, Fresno.

MAJOR	*Units*
Nurs 17, 17L, 27, 27L, 36	15
Nurs 109, 109L, 110, 110L, 114, 119, 119L, 124, 124L, 125, 129, 129L, 145	39
Nursing Electives	6
	60

Additional Requirements: Micro 20 and 21; H Ec 31, 40, or 138; Psych 119 or H Ec 39; Chem 2A-C; Phy 22, 23; Spch 3, 7, 8, or Drama 22; Engl 1 or 20; Psych 10 or 60T; Soc 1, 2, or Anth 2. Psych 25 recommended.

Program for Students Who Are Registered Nurses

Registered nurses who are applicants for the baccalaureate degree must meet admission requirements of the college and the nursing major and possess a current California license in nursing. A maximum of 30 units may be obtained for selected courses through credit by examination. For further information write Department of Nursing, Fresno State College.

STANDARD DESIGNATED SERVICES CREDENTIAL WITH SPECIALIZATION IN HEALTH

The Nursing Department offers a program to prepare the registered nurse to meet the state requirements for the Standard Designated Services Credential with Specialization in Health, School Nurse. For further information consult the department adviser.

MASTER OF SCIENCE DEGREE

The master of science degree in nursing is designed to prepare teachers, supervisor-administrators, and clinical nursing specialists in the areas of medical-surgical, community mental health, and community health nursing. Applicants must have completed an undergraduate program substantially the equivalent of the undergraduate program in nursing at Fresno State. A minimum of thirty units is required, of which at least 8 must be in core courses and 12 in the field of concentration. The remaining units are selected in related fields. For specific requirements consult the departmental adviser; for general requirements see *School of Graduate Studies.*

COURSES

NURSING (Nurs)

17. Introduction to Nursing Theory (3) (Former Nurs 16)
Prerequisite: Chem 2A-C, Phy 22, 23, Nurs 17L concurrently. Introduction to basic nursing principles to meet needs of patients.

17L. Introduction to Nursing Process (3) (Former Nurs 16)
Prerequisite: Nurs 17 concurrently. Orientation to problems and practices in professional nursing through laboratory assignments. (9 lab hours)

27. Medical-Surgical Nursing I (3) (Former Nurs 26)
Prerequisite: Nurs 17, 17L, H Ec 31 or 40 or 138, Micro 20, 21 (or concurrently), Nurs 27L concurrently. Basic concepts essential to medical-surgical nursing; care of the patient and family.

27L. Medical-Surgical Nursing I Laboratory (3) (Former Nurs 26)
Prerequisite: Nurs 27 concurrently. Laboratory experience emphasizing patient-centered approach to nursing care of medical-surgical patients. (9 lab hours)

36. Historic and Legal Influences in Nursing (3) (Former Nurs 35, 116)
Strategic influences of historical, social, political, religious, and scientific movements in nursing.

80T. Topics in Nursing (1–3; max total 12 if no topic repeated) (See Nurs 180T)

109. Maternal Nursing (3) (Former Nurs 111)
Prerequisite: Nurs 27, 27L, H Ec 39 or Psych 119 (or permission of instructor), Nurs 109L concurrently. Concepts of family-centered maternity nursing; focus upon needs of the family and their adaptations during child-bearing cycle and neonatal period.

109L. Maternal Nursing Laboratory (3) (Former Nurs 111)
Prerequisite: Nurs 109 concurrently. Laboratory experience to acquire skills and judgment in applying concepts of family-centered maternity nursing. (9 lab hours)

110. Nursing of Children (3) (Former Nurs 112)
Prerequisite: Nurs 27, 27L, Psych 119 or H Ec 39 (or permission of instructor); Nurs 110L concurrently. Theoretical aspects of nursing care of children including health maintenance, common illnesses, the relationship of illness to growth and development, and family relationships.

110L. Nursing of Children Laboratory (3) (Former Nurs 112)
Prerequisite: Nurs 110 concurrently. Laboratory experience with children at various points in the health-illness continuum. (9 lab hours)

114. Public Health Science (3)
Trends in public health administration, organization, functions; national, state, local, public, voluntary agencies; interpretation and use of vital statistics; environmental health and epidemiology.

119. Psychiatric Nursing (3) (Former Nurs 120)
Prerequisite: Nurs 27, 27L, Psych 119 or H Ec 39 (or permisson of instructor), Nurs 119L concurrently. Mental disorders, the psychoses and psychoneuroses; causes, prevention, treatment, and total nursing care; social problems involved in modern concepts of mental illness.

119L. Psychiatric Nursing Laboratory (3) (Former Nurs 120)
Prerequisite: Nurs 119 concurrently. Guided laboratory experience in providing nursing care for individuals who have emotional and behavioral disorders in a variety of treatment settings. (9 lab hours)

124. Medical-Surgical Nursing II (3) (Former Nurs 126)
Prerequisite: Nurs 109, 109L, 110, 110L, 119, 119L; Nurs 124L concurrently. Total patient care utilizing a problem-solving approach.

124L. Medical-Surgical Nursing II Laboratory (3) (Former Nurs 126)
Prerequisite: Nurs 124 concurrently. Laboratory experience in planning and directing nursing care for individuals and groups of patients. (9 lab hours)

125. Seminar in Nursing (3)
Prerequisite: Nurs 27, 27L. Basic concepts of research as it relates to reading nursing studies; understanding problem-solving techniques.

127. Principles of Teaching Nursing (3)
Prerequisite: Nurs 109, 109L, 110, 110L. The teaching-learning process; organization of instruction for the patient, auxiliary workers, community groups.

128. Perspectives of Professional Nursing Practice (5)
Prerequisite: Nurs 109, 109L, 110, 110L, 119, 119L. Further development and expansion of knowledge and skills in clinical nursing. (3 seminar, 6 lab hours)

129. Community Health Nursing (3) (Former Nurs 130)
Prerequisite: Nurs 109, 109L, 110, 110L, 114, 119, 119L; Nurs 129L concurrently. Preparation to meet the needs of individuals and groups for health promotion, health maintenance, and disease prevention in the home.

129L. Community Health Nursing Laboratory (3) (Former Nurs 130)
Prerequisite: Nurs 129 concurrently. Field experiences selected from a variety of community agencies to provide a basic structure to help the student implement nursing skills and extend knowledge to individuals and groups in a community setting, and in the home. (9 lab hours)

140. Disaster Nursing (3)
Responsibilities and functions of a professional nurse in common emergencies and mass disaster.

145. Principles of Nursing Administration (3)
Prerequisite: Nurs 109, 109L, 110, 110L, 119, 119L. Principles of nursing service administration; interpersonal relationships; team concept; leadership roles.

150. School Nursing (8)
Prerequisite: Nurs 129, 129L. Role of the nurse in the school health program. (3 lecture, 15 lab hours)

180T. Topics in Nursing (1–3 units; max total 12 if no topic repeated)
Prerequisite: permission of instructor. Selected topics in nursing.

190. Independent Study. (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES

(*See Course Numbering System—Definitions and Eligibility*)

210. Seminar in Nursing (2)
Review and critical analysis of current developments in nursing.

221. Seminar in Nursing Research (3)
Application of general techniques of research methodology to specific problems in nursing.

245T. Seminar in Clinical Nursing (3; max total 6)
Synthesis and application of knowledge pertinent to clinical specialization in nursing.

247. Seminar in Administration (3)
Synthesis and application of knowledge which will enable nurses to organize, administer, supervise, and evaluate nursing services.

249. Seminar in Nursing Education (3)
Philosophical and conceptual foundation for teaching in schools of nursing and nursing service organizations.

250. Practicum in Clinical Nursing (3)
Assignment for field experience to local health agencies.

251. Practicum in Nursing Administration (3)
Assignment for field experience to a variety of local health agencies.

252. Practicum in Nursing Education (3; max total 6)
Assignment for field experience to local departments, schools of nursing, or inservice programs in nursing.

290. Independent Study (1–3; max total 3)
See *General Information—Independent Study.*

299. Project or Thesis (2–4; max total 4)
Prerequisite: See *Master's Degree—Thesis Requirement.* Preparation, completion, and submission of an acceptable project or thesis for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

302T. Selected Topics in Nursing (1–3; repeatable with different topics)

PHYSICAL EDUCATION AND RECREATION DEPARTMENT

MEN

Professors: Bourdet (Chairman), M. M. Anderson, Burgess, Gleason, Hairabedian, B. Johnson, L. Pape, Rogers, Warmerdam, Wild

Associate Professors: Estes, Frances, Gregory, Sawyer (Coordinator, Recreation), Van Galder

Assistant Professors: Ballard, Carbajal, S. Johnson, J. Wilcox (Coordinator, Men)

Lecturers: Conrad, Guzman

Head Coach: Bob G. Bennett

Coaches: Colbert, Padilla

Part-time: Crummett, Patnott, Vasilovich, Wagner

WOMEN

Professor: Mason

Associate Professors: Bevans, R. Flake, Mott, Schroll, S. Thompson, Thomson (Coordinator, Women)

Assistant Professors: Ayer, Hunter, Mohamed, Overstreet, Owensby, Pickel, Poston, Predika, Trostle

Part-time: Croy, Keller, Koehler, Walts

ACTIVITIES

Students are expected to take four activities courses (MPE, CPE, WPE, CPES, MPES, WPES series) during the first four semesters. (See *Degrees and Credentials—Special Course Requirements.*) After the completion of this graduation requirement, additional physical education courses may count as upper division credit; for other provisions see *Courses—Note.* Students majoring or minoring in physical education may count a maximum of twelve units of upper and lower division activity courses toward the total units required for the bachelor's degree; other students may apply a maximum of eight units to the total degree requirement. Candidates preparing for elementary teaching or minoring in physical education are advised to have experience in rhythmic activities.

MAJORS

Men

A major in physical education for the bachelor of arts degree consists of 48 units listed below, exclusive of the general education requirement.

	Units
PE 30, 35A-B-C, 45A-B-C-D	16
PE 106, 108, 152, 153, 154, 156A-B-C, 159	23
Elect from: PE 125 A-B-C-D	9
	48

Additional Requirements: Phy 22, 23, H Ec 40 or 42.

Women

A major in physical education for the bachelor of arts degree, with two options available, consists of 43-44 units listed below, exclusive of the general education requirement.

Option I. General	*Units*
Foundations: PE 30, 31, 44	5
Performance laboratories: PE 45A-B-C-D, 115A-B-D-E	15
Conceptual interpretations: PE 144, 152, 153, 154, 156A-B-C, 159	20
Approved electives	3
	43

Additional Requirements: Phy 22, 23.

Option II. Dance	*Units*
CPE 117D	2
PE 59, 65A-B-C, 156A-B, 164T, 166A-B-C, 171	27
Approved electives (at least 10 upper division; consult with adviser. Requirement for secondary credential PE 30, 153)	15
	44

Additional Requirements: Phy 22, 23.

MINORS

Men

The minor in physical education consists of 24 units which permits, with guidance, a selection of courses to satisfy special interests and needs.

PE 30; elect from 35A-B-C; 45A-B-C	12
PE 153	3
Elect from: PE 125A-B-C-D	9
	24

Women

The minor in physical education, with two options, consists of 21 units of which at least 12 must be upper division.

Option I. General	*Units*
PE 30, 31, 45D	6
PE 115B, 152	4
Approved physical education electives	11
	21

Option II. Dance	
CPE 17C, 59, PE 59, 65A-B	10
PE 166A-B, 164T, 171	10
Electives (approved ud)	1
	20

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education, see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in physical education is based on the equivalent of the undergraduate major at Fresno State. At least 24 of the 30 units required for the degree must be in graduate courses in physical education. For specific requirements, consult the chairman of the department graduate committee; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area III:* CPE 11, 16, 17A-B-C-D, 58. *Area V:* M, C, W, SC, SM, SW series except courses listed in Area III. (See *General Education—Courses*)

COURSES

Note: Not more than 2 courses in any one activity (MPE, CPE, WPE, CPES, MPES, WPES) may be applied toward the graduation requirement. Activity courses must be taken in sequence and may not be repeated for credit except as noted. Upper division credit will be

given for activities, with exception of MPE 2, and WPE 28, taken after the completion of 4 semesters of lower division activities courses.

Coeducational (CPE)

1. Adaptive Body Mechanics (1)
May be repeated with permission of instructor. Medical referrals.

2. Experimental Physical Education (1) (Former EXP 12)
Participation in a physical education activity for credit and in an experimental investigation.

4. Synchronized Swimming (1)
Prerequisite: intermediate swimming skill.

5. Senior Lifesaving (1)
(Prerequisite: permission of instructor).

6. Water Safety Instructor Course (2)
Prerequisite: current lifesaving certificate.

8. Advanced Tennis (1)
Prerequisite: M20, W7, or permission of instructor.

9. Elementary Gymnastics (1)

10. Intermediate Gymnastics (1)
Prerequisite: C9 or permission of instructor.

11. Elementary Folk Dance (1)

12. Intermediate Folk Dance (1)
Prerequisite: CPE 11.

14. Elementary Social Dancing (1)

15. Intermediate Social Dancing (1)
Prerequisite: C14 or permission of instructor.

16. Introduction to Contemporary Dance (1)

17A. Contemporary Dance Technique (1) (Former C17)
Prerequisite: C16 or permission of instructor.

17B. Contemporary Dance Technique (1)
Prerequisite: C17A or permission of instructor.

17C. Contemporary Dance Technique (1)
Prerequisite: C17B or permission of instructor.

17D. Advanced Dance Technique (2; max total 8) (Former C18)
Prerequisite: C17C or permission of instructor.

21. Elementary Archery (1)

22. Intermediate Archery (1)
Prerequisite: C21, M28, W21, or permission of instructor.

24. Elementary Bowling (1)
(Fee $1.45 per week)

25. Intermediate Bowling (1)
(Fee $1.45 per week) Prerequisite: C24 or permission of instructor.

27. Elementary Ice Skating (1)
(Fee $15)

28. Intermediate Ice Skating (1)
(Fee $15) Prerequisite: C27 or permission of instructor.

29. Advanced Ice Skating (1)
(Fee $15) Prerequisite: C27 or C28 or permission of instructor.

31. Elementary Badminton (1)

32. Intermediate Badminton (1)
Prerequisite C31, M34, W31, or permission of instructor.

37. Intermediate Golf (2)
Prerequisite: M25, W36, or permission of instructor.

39. Jogging (1)

40. Elementary Skiing (2)
Limited to novice skiers.

41. Elementary Sailing (2)

42. Skin and Scuba (2)

43. Elementary Western Riding (1)
(Fee $45 per semester)
Limited to novice riders. Prerequisite: permission of instructor.

45. Elementary Fencing (1)

50. Elementary Square Dance (1)

55. Elementary Modern Jazz Dance (1) (Former C19)

56. Intermediate Modern Jazz Dance (2)
Prerequisite: C55 or 58 or permission of instructor.

58. Elementary Ballet (1) (Former C20)

59. Intermediate Ballet (2; max total 8)
Prerequisite: C58 or permission of instructor.

67. Volleyball (1)

80. Synchronized Swim Show Production (2; max total 8)
Prerequisite: C4 or permission of instructor.

82. Hatha Yoga (1) (Former EXP 185)

85. Basic Mountaineering (2) (Former EXP 158)

Men Only (MPE)

1. Group Games (1)
Archery, badminton, handball, tennis.

2. Group Games (1)

3. Soccer (1)

7. Basketball (1)

10. Elementary Swimming (1)

11. Intermediate Swimming (1)
Prerequisite: M10 or permission of instructor.

13. Elementary Boxing (1)

16. Elementary Wrestling (1)

18. Intermediate Wrestling (1)
Prerequisite: M16 or permission of instructor.

19. Elementary Tennis (1)

20. Intermediate Tennis (1)
Prequisite: M19 or permission of instructor.

21. Advanced Tennis (1)
Prerequisite: M20 or permission of instructor.

22. Elementary Handball (1)

23. Intermediate Handball (1)
Prerequisite: M22 or permission of instructor.

24. Advanced Handball (1)
Prerequisite: M23 or permission of instructor.

25. Elementary Golf (1)

28. Elementary Archery (1)

29. Elementary Paddle Ball (1)

32. Intermediate Gymnastics (1)
Prerequisite: M31 or permission of instructor.

34. Elementary Badminton (1)

35. Intermediate Badminton (1)
Prerequisite: M34 or permission of instructor.

37. Elementary Volleyball (1)

38. Intermediate Volleyball (1)
Prerequisite: M37 or permission of instructor.

40. Body Building (1)

41. Intermediate Body Building (1)
Prerequisite: M40 or permission of instructor.

45. Self-Defense (1)

Intercollegiate—Coeducational (CPES)
(Courses may be repeated.)

2. Badminton (1)

Intercollegiate—Men (MPES)
(Courses may be repeated.)

12. Baseball (1)

13. Basketball (1)

14. Cross Country (1)

15. Football (1)

16. Golf (1)

19. Swimming (1)

20. Tennis (1)

21. Track and Field (1)

23. Soccer (1)

24. Water Polo (1)

25. Wrestling (1)

Intercollegiate—Women (WPES)
(Courses may be repeated.)

3. Basketball (1)

5. Golf (1)

6. Intercollegiate Swimming (1)

7. Tennis (1)

9. Volleyball (1)

Women Only (WPE)

1. Elementary Swimming (1)
For nonswimmers.

2. Low Intermediate Swimming (1)

3. High Intermediate Swimming (1)
Prerequisite: W2 or permission of instructor.

6. Elementary Tennis (1)

7. Intermediate Tennis (1)
Prerequisite: W6 or permission of instructor.

10. Intermediate Gymnastics (1)

21. Elementary Archery (1)

26. Conditioning Exercises and Figure Control (1)

28. Fundamentals (1)

29. Elementary Paddle Ball (1)

31. Elementary Badminton (1)

33. Elementary Track and Field (1)

36. Elementary Golf (1)

46. Soccer, Hockey, and Speedball (1)

48. Volleyball, Basketball, and Softball (1)

CPE, MPE, WPE, CPES, MPES, WPES Upper Division Activities Courses
(See Courses—Note.)

Physical Education (PE)

11A. Officiating Tennis and Volleyball (1) (See PE 111A)
Women only. Not open to students with credit in PE 111A.

11B. Officiating Basketball (1) (See PE 111B)
Women only. Not open to students with credit in PE 111B.

30. Foundations of Physical Education (2)
Coeducational. History and foundations of the physical education program in secondary schools; personal, social, and professional requirements; demands on the physical education teacher.

31. Motor Learning (2)
Coeducational. Study and experience in selected aspects of human motor performance; laws of physics, rhythmical analysis and individual patterns of learning.

35A. Theory and Analysis of Team Sports (2)
Men only. Scheduled for 8 weeks of semester. Limited to physical education and recreation majors and minors. Analysis and practice of skills. (1 lecture, 2 lab hours)

35B. Theory and Analysis of Combatives (2)
Men only. Scheduled second 8 weeks of semester. Limited to physical education and recreation administration majors and minors. Analysis and practice of skills. (1 lecture, 2 lab hours)

35C. Theory and Analysis of Gymnastics (2)
Men only. Limited to physical education and recreation administration majors and minors. Analysis and practice of skills. (1 lecture, 2 lab hours)

44. Instructional Laboratory I (1)
Coeducational. Limited to physical education major and minor students. Designed to provide an opportunity to work in an instructional situation.

45A. Theory and Analysis of Aquatics (2)
Coeducational. Limited to physical education and recreation administration majors and minors. Prerequisite: intermediate skill. Study and practice of beginner's skills and swimming strokes; elements of diving and skills basic to lifesaving; skill progression for various levels; water polo, scuba diving. (2 2-hour labs)

45B. Theory and Analysis of Racquet Sports (2)
Coeducational. Limited to physical education and recreation administration majors and minors. Prerequisite: intermediate skill. Study and practice of strokes and tactics; rules; history; skill progression for various levels. (2 2-hour labs)

45C. Theory and Analysis of Golf and Archery (2)
Coeducational. Limited to physical education and recreation majors and minors. Prerequisite: M25 or W36. Study and practice of values and fundamentals in golf and archery; organization and conduct in the secondary school physical education program.

45D. Theory and Analysis of Folk, Square and Social Dance (2)
Coeducational. Limited to physical education and recreation administration majors and minors. Prerequisite: C11. Study and practice of elementary leadership in folk, square, and social dance. (2 2-hour labs)

59. Music as Dance Accompaniment (3)
Coeducational. Kinds of accompaniment: live and recorded music, percussion scores, spoken word. Student selection and preparation of accompaniment: dance technique and composition.

63. Dance Performance (2; max total 8) (Same as PE 163)
Coeducational. Students with fewer than 60 units register for PE 63; those with more than 60 units register for PE 163. Prerequisite: C17A, PE 65, or permission of instructor. Group laboratory experience in presentation of major productions for public performance.

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65A. Elementary Dance Composition: Musical Forms (2) (Former PE 65)
Coeducational. Prerequisite: C16 or 116 and C17A or B concurrently. Exploration of composition through musical forms with emphasis on increasing ability to use original movement.

65B. Elementary Dance Composition: Preclassic Forms (2) (Former PE 65)
Coeducational. Prerequisite: C16 or 116 and C17A or B concurrently. A continuing study of dance with emphasis on pre-classic forms and improvisations.

65C. Elementary Dance Composition: Modern Forms (2)
Coeducational. Prerequisite: 65A or B, C17A or 17B taken concurrently. Exploration of modern forms with emphasis on original choreography.

106. Care and Conditioning of Athletes (2)
Coeducational. Principles of training for specific athletic schedules; methods of preventing injuries in athletic competition; first aid treatment of athletic injuries; demonstrations and practice in prophylactic taping techniques.

107. Field Work in Care and Conditioning of Athletes (1)
Prerequisite: PE 106 or permission of instructor. Practical experience in the field of athletic training.

108. Organization of Intramural Sports (2)
Coeducational. For physical education and recreation administration majors. Organization, administration, and motivation of a program of intramural activities in secondary schools.

111A. Officiating Tennis and Volleyball (1)
Women only. Not open to students with credit in PE 11A. Prerequisite: experience in tennis and volleyball. Rules, officiating techniques, and practice in officiating. Students may elect to take national theoretical ($0.25) and practical ($0.75) examinations given by the San Joaquin Board of Women Officials. (2 1-hour lecture labs)

111B. Officiating Basketball (1)
Women only. Not open to students with credit in PE 11B. Prerequisite: experience in basketball. Rules, officiating techniques, and practice in officiating. Students may elect to take national theoretical ($0.25) and practical ($0.75) examinations given by the San Joaquin Board of Women Officials. (2 1-hour labs)

112A. Officiating Football (1)
Men only. Scheduled second 8 weeks of semester. Prerequisite: varsity squad experience in football or PE 125A; PE 112B concurrent, or permission of instructor. Analysis and interpretation of rules for football; procedures, mechanics and practice in officiating.

112B. Officiating Basketball (1)
Men only. Scheduled first 8 weeks of semester. Prerequisite: varsity squad experience in basketball or PE 125B. Analysis and interpretation of rules for basketball; procedures, mechanics, and practice of officiating.

112C. Officiating Track and Field (1)
Men only. Prerequisite: varsity squad experience in track or PE 125C. Analysis and interpretation of rules for track; procedures, mechanics, and practice in officiating.

112D. Officating Baseball (1)
Men only. Prerequisite: varsity squad experience in baseball or PE 125D. Analysis and interpretation of rules for baseball; procedures, mechanics, and practice in officiating.

115A. Theory and Analysis of Modern Dance (2)
Coeducational. Limited to physical education dance option I and II majors and minors. Prerequisite: C16. Practice and analysis of body movement in dance, rhythmic, space and quality elements. Practice in planning and presenting teaching techniques, movement progressions, and group studies; elementary composition; brief history of dance. (2 2-hour labs)

115B. Theory and Analysis of Team Sports (2)
Women only. Limited to physical education majors and minors. Prerequisite: W46 and W48. Skill, strategy, and rules of team sports. Materials, interpretations, and organization of team sports for girls in secondary schools. (2 2-hour labs)

115D. Theory and Analysis of Gymnastics (2)
Women only. Prerequisite: C9. Analysis and performance of elementary and intermediate stunts in tumbling, free exercise, apparatus, trampoline, and rhythmic gymnastics. Theory of skill progressions, class organization, spotting techniques, judging, analysis and development of routines, and organization of gymnastic competition. (2 2-hour lecture labs)

115E. Theory and Analysis of Track and Field (1)
Women only. Prerequisite: W33. Analysis and performance of track and field events. Theory of skill progressions, class organization, officiating; planning, promoting, and conducting meets; purchase and care of equipment and facilities.

125A. Theory and Analysis of Football (3)
Men only. Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

125B. Theory and Analysis of Basketball (3)
Men only. Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

125C. Theory and Analysis of Track and Field (3)
Men only. Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

125D. Theory and Analysis of Baseball (3)
Men only. Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

144. Instructional Laboratory II (1)
Coeducational. Limited to major and minor students. Designed to provide an opportunity to work in an instructional situation.

152. Elementary School Physical Education (2)
Coeducational. Activities, materials, and methods for teaching physical education in elementary schools based on the California state program. (2 2-hour lecture-labs)

153. Proseminar in Principles of Physical Education (3)
Coeducational. Prerequisite: PE 30. Principles basic to sound philosophy of physical education; appraisal of historical development; relationship to health education, recreation, and other areas; foundation and functions of physical education in contemporary American society.

154. Proseminar in Organization and Administration (3)
Coeducational. Prerequisite: PE 30, 153. Organization and administration: classification, scheduling, planning facilities for instruction and recreation; role of the physical education teacher in recreation, equipment, budget, co-curricular program, student leadership, community relationship.

156A. Kinesiology (3)
Coeducational. Prerequisite: Phy 1, 22 and 23 or equivalent. Human movement: biological and mechanical bases, application of skeleto-muscular considerations and principles of mechanics to human movements.

156B. Physiology of Exercise (3)
Coeducational. Prerequisite: Phy 22 and 23 or equivalent. Physiologic bases of movement, work and exercise; physiologic concepts related to respiration, circulation, digestion, metabolism, and to their roles in physical activity.

156C. Adaptive Physical Education (2)
Coeducational. Prerequisite: Phy 22 and 23 or equivalent, PE 156A. Anomalies and physical divergencies among elementary and high school students, their etiology and consequences; development of special provisions to meet the needs of atypical students.

159. Tests and Measurements (3)
Coeducational. Prerequisite: PE 30. Scientific testing in physical education; analysis, study, and construction of tests; diagnosis of physical efficiency and physiological reactions to exercise, sports, and games.

161. Curriculum and Methods of Physical Education in Secondary Schools (3) (Former PE 151)
Coeducational. Prerequisite: PE 30, 153, and/or concurrently (men) PE 125A-B-C-D, (women) PE 115A-B-D-E. Principles applied to the teaching-learning process; organization and observation of physical education activities in secondary schools; development of physical education programs.

163. Dance Performance (2; max total 8) (See PE 63)

164T. History of Dance (3; max total 12 if no topic repeated)
Coeducational. Evolvement of dance as an art form; cultural implications; changing concepts in dance style and form. Topics may include the following periods: Primitive to Renaissance, Baroque to 20th Century, 20th Century.

166A. Intermediate Dance Composition: Theater Forms (2) (Former PE 166)
Coeducational. Prerequisite: PE 65A, 65B, C17C or 17D concurrently. Choreography with emphasis on the theatrical environment and contemporary forms. Analysis of styles and trends of compositional form with experience in development of individual and group dance studies.

166B. Intermediate Dance Composition: Chance Forms (2) (Former PE 166)
Coeducational. Prerequisite: PE 65A, 65B, C17C or 17D concurrently. Choreography with emphasis on the use of chance methods, group compositions and a synthesis of previous dance experience.

166C. Intermediate Dance Composition: Improvisational Forms (2)
Coeducational. Prerequisite: PE 65A-B-C, C17D concurrently. Choreography with emphasis on improvisation leading to solo compositions and small group compositions.

167. Dance in Education (3)
Coeducational. Prerequisite: permission of the instructor. A study of the unique potential found in movement for the development of creativity through the teaching of dance.

168. Elementary Dance Notation (3) (Former EXP 144)
Coeducational. Prerequisite: PEC 16, PE 65. Designed to study the system of Labanotation. Will include experience in recording and interpreting dance scores.

171. Philosophical Bases and Trends in Dance (3)
Coeducational. A study of the elements and principles common to all arts and their relationship to dance.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

199. Supervised Work Experience (2; max total 4)
Coeducational. Open only to physical education majors. Prerequisite: upper division status, GPA 2.5 last 30 units, consent of department coordinator and instructor.

GRADUATE COURSES (PE)

(See *Course Numbering System—Definitions and Eligibility*)

221. Body Mechanics (3) (Former PE 230.1)
Open to men and women. Prerequisite: PE 156A or permission of instructor. Analysis of posture and body mechanics; methods and techniques for the examination and treatment of faulty body mechanics and other anomalies; and exercises for achieving and maintaining correct body mechanics.

222. Analysis of Athletic Performance (3) (Former PE 230.2)
Open to men and women. Prerequisite: PE 156A and 156B or permission of instructor. Consideration of the factors affecting performance in various sports. Application of laws of physics, principles of exercise, physiological, and psychological considerations to human performance. Intensive analysis of sports skills.

223. Scientific Basis of Motor Learning (3)
Seminar in the study of human movement from a physio-psychological perspective. Emphasis on learning theories, motor educability, and kinesthetic awareness in human movement via sport, dance, and games.

230. Statistical Inference in Physical Education (3) (Former PE 230.4)
Theory and nature of statistical inference; seminar in the study of statistical methodology relating to the selection of the most appropriate statistical method, the correct application of the statistical technique, and the interpretation of findings.

231. Research in Physical Education (3) (Former PE 230.3)
Seminar in research methodology; identification of researchable problems in physical education and related areas; use of library resources, data gathering and analyses, critiquing of recorded research, writing of research reports.

232. Quantitative Measurement in Exercise Physiology (3) (Former PE 230.5)
Prerequisite: PE 156A or permission of instructor. Use of instruments and devices for measuring physiological factors related to exercise. Measurement of these factors under experimental conditions in the human performance laboratory.

240. Facilities and Equipment in Physical Education (3) (Former PE 240.1)
Open to men and women. Functional planning of indoor and outdoor facilities for schools and recreation centers. Design and layout of school physical education-athletic facilities. Evaluation of school plants in the Fresno and valley area. Budget considerations in planning for the purchase of equipment.

241. Administration in Physical Education (3) (Former PE 240.2)
Examination of innovative ideas in the fields of education and physical education which relate to physical education administration. Emphasis on discovering ways to incorporate recent information to establish programs.

242. Program Development in Physical Education (3) (Former PE 240.4)
Study of the current education scene to provide students with an understanding of the role that school physical education plays in today's education. Identification of sound procedure and practice in organizing and conducting relevant programs of physical education.

250T. Topics in Physical Education (3; max total 6 if no topic repeated)
Prerequisite: permission of instructor. Advanced studies in theoretical research in selected topics.

260. Historical Concepts of Physical Education (3) (Former PE 240.5)
Interpretation of exercise and sport in western thought and practice, from 3000 B.C. to the present.

261. Philosophical Concepts in Physical Education (3) (Former PE 240.3)
Exposure to philosophical thought as conceived by traditional and contemporary philosophers. Exploration of the techniques utilized to bring specific philosophical positions to action as students examine relationships between their philosophy and philosophies from which current practices and problems in the field of physical education emerge.

262. Psycho-Socio Implications of Sport (3)
Investigation of the nature of man, the player; cultural factors leading to the development of the symbolic field of sport; and sport as an agent of change.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299. Thesis or Project (2–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System*)

310. Analysis of Team Activities (2–3; max total 12 if no area repeated)

320. Analysis of Individual Activities (2–3; max total 12 if no area repeated)

RECREATION

The Physical Education and Recreation Department offers a bachelor of science degree with a major in recreation for students who are preparing for leadership and supervisory responsibilities in recreation service. The curriculum offers each student an opportunity to select course material in public, private, and therapeutic settings. Curriculum experiences are designed to serve as a foundation for graduate education in recreation service.

BACHELOR OF SCIENCE DEGREE

The bachelor of science degree with a major in recreation is granted upon completion of 128 units including the courses listed below. The general degree regulations and general education requirements must also be fulfilled.

MAJOR

Core Program

	Units
Rec 55, 73, 73L, 172, 173, 173L, 177	17

General Option

Rec 160, 168, 171, 185 or 186	21
Elect from: Rec 167, 169, B A 18, 118, Jour 113, Mgt 110A, O Ad 105,Pl Si 181, Psych 160T, S Wel 127, Spch 167	12
	33

Therapeutic Option

Rec 165, 166, 187	18
Psych 10	3
Recreation elective	3
Elect from: Psych 111, 123, 145, A S 160, 162, C D 100	6
Elect from: H S 110, 157	3
	33

MINOR

The minor in recreation for the bachelor of science degree consists of 23–24 units of which 6 must be upper division and permits, with guidance, a selection of courses to satisfy special interests and needs. The recreation minor gives training in activities suitable for use in recreation programs of communities, schools, youth agencies, and clubs.

	Units
Rec 60, 73, 73L, 171, 173, 173L	14
PE 45A or CPE 6 and PE 108	4
Select two courses from an approved section of Art 120T, Music 9 or Drama 137	5–6
	23–24

COURSES

RECREATION (Rec)

55. Principles of Recreation (3) (Former Rec 155)
Philosophical, theoretical, and historical base for recreation service in contemporary American society; development of a personal philosophy of recreation through education information, and stimulation.

60. Recreation in American Society (3)
Nonmajors only. Development of recreation service in the United States; recreation service at the local, state, and federal level.

73. Leadership in Recreation Service (2) (Former Rec 66)
Theoretical and philosophical basis for leadership. Social dynamics of participation in recreative activities.

73L. Leadership in Recreation Service Laboratory (2) (Former Rec 66)
Concurrent with Rec 73. Practical leadership experience in supervised recreation settings.

160. Camp Management (3)
Prerequisite: Rec 55, 73, 73L. Practical skills in camping; leadership, supervision, and management of various types of camp. (2 field trips; approximately $10 camp trip expenses).

165. Foundations of Therapeutic Recreation Service (3)
Prerequisite: Rec 55. Concentrated study of recreation service for the ill and disabled. Individual projects in the area of special interest: mental retardation, physical disability, aging, emotionally disturbed.

166. Modifying Recreation Resources for Disabled Persons (3)
Prerequisite: Rec 165. Analysis of problems encountered by persons with physical disabilities in utilizing recreation resources, i.e., theatres, museums, sports, game and activity equipment. Adaptations and modifications of recreation resources.

167. Private Recreation Resources (3)
Prerequisite: Rec 55. Evaluation of private recreation resources including membership organizations, private clubs, College Union, and commercial recreation endeavors; problems include program content, leadership, facilities, and organizational structure.

168. Legal and Financial Aspects of Recreation Service (3)
Prerequisite: Rec 171, Acct 3, or permission of instructor. Legal and financial aspects of recreation service; budget analysis, legal terminology, and their role in recreation service.

169. Development and Management of Commercial Recreation (3)
Prerequisite: Rec 55, 167. Evaluations of commercial recreation enterprises; problems include the establishment, organization, and management of commercial recreation.

171. Community Recreation (3) (Former Rec 161A)
Prerequisite: Rec 55. Evaluation of community recreation programs funded by public monies.

172. Organization and Administration of Recreation (3)
Prerequisite: Rec 55, 73, 173, or permission of instructor. Preparation for the role of administrator of recreation services; activity programs, the provision of sites and facilities, management of personnel and finances, volunteer personnel.

173. Programs of Recreation (2)
Prerequisite: Rec 55, 73, 73L. Principles and procedures of planning programs for various age groups and settings.

173L. Programs of Recreation Laboratory (2)
Prerequisite: Rec 173 (concurrently). Practical program experience in recreation settings.

177. Analysis of Leisure and Park Resources (3)
Prerequisite: Rec 55. Concentrated study of park planning, designs, and other resources for recreation purposes. Individual projects in the area of special interest: public, private, or therapeutic.

185. Internship in Private Recreation (12)
Prerequisite: completion of core and option requirements; 2.5 GPA in courses applied on the major. Directed supervisory experience with a private recreation agency. Individual development in administration, supervision, program planning, and community and public relations; reports and conferences required.

186. Internship in Public Recreation (12)
Prerequisite: completion of core and option requirements; 2.5 GPA in courses applied on the major. Directed supervisory experience with a pubic recreation agency. Individual development in administration, supervision, program planning, community and public relations; reports and conferences required.

187. Internship in Therapeutic Recreation (12)
Prerequisite: Rec 165 and 166; Psych 145. Completion of core and option requirements; 2.5 GPA in courses applied on the major. Supervised, directed full-time experience in the field of therapeutic recreation; reports and conferences required.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

RADIO-TELEVISION DEPARTMENT

Professors: Highlander (Chairman), Burriss
Associate Professors: Adams, Lane
Assistant Professors: Alden, M. Johnson, Monson
Lecturer: Warner

The Radio-Television Department offers courses of study for those who seek professional careers in the media or in teaching. Career potentials in media include commercial as well as educational broadcasting or cinema. Departmental programs are based on the study of the social, educational, and economic significance of the media and provide for professional preparation in a variety of specialized areas.

The department offers courses leading to the Bachelor of Arts degree in Radio-Television and the Master of Arts degree in Mass Communication.

MAJOR

The radio-television-broadcasting major combines the study of media theory and practice with laboratory experience. A core of required courses provides a foundation upon which a student, in consultation with his faculty adviser, builds a program of study in areas of special interest. Such areas include criticism, performance, production, management, and script writing as well as the application of media in education. The student is encouraged to include courses of study in other fields relevant to this major interest.

Radio-Television Broadcasting	*Units*
R-TV 15 or 115, 25, 40, 41, 44, 140, 141, 160	23
Approved electives (Minimum 12 units upper division)	17
	40

MINOR

Radio-Television Broadcasting	
R-TV 40 or 140, 41 or 44, 141	9
Approved electives (Minimum 6 units upper division)	11
	20

CREDENTIAL PROGRAM

For information on the current credential program consult the departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE IN MASS COMMUNICATION

The graduate program for the master of arts degree in mass communication is an interdisciplinary degree program jointly offered by the journalism and radio-television faculties of the college. See *Special and Interdisciplinary Programs-Interdisciplinary Graduate Study—Mass Communication.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements: Area III: R-TV 40, 128, 140, 143, 160, 173. Area V: R-TV 188T. (See *General Education—Courses*)

COURSES

RADIO-TELEVISION (R-TV)

15. Broadcasting Laboratory (2)
Classroom demonstration in use and care of broadcast equipment; limitations and potentialities; application of basics through supervised activities. (2 lab and 2–4 arranged hours)

25. Fundamentals of Broadcast Performance (3)
Primarily for students with a major or minor in Radio-TV. Basic theories and techniques of broadcast-cinema performance. Study of vocal and visual aspects of performance, analysis, and preparation of program material for performance. (2 lecture, 2 lab hours)

40. Foundations of Broadcasting (3)
Basic theories of mass communication as the framework for the study of radio, television, and cinema. Historical development, regulation, social influences, and contemporary standards of evaluation in the contexts of theory and practice.

41. Radio Production (3)
Prerequisite: R-TV 40. Lecture and laboratory experiences in program development and production techniques as they apply in radio broadcasting and other sound media. (2 lecture, 2 lab hours)

44. Television Production (3)
Prerequisite: R-TV 40. Lecture and laboratory experiences in program development and production techniques as they apply in television. (2 lecture, 2 lab hours)

115. Advanced Broadcasting Laboratory (2; max total 6)
Prerequisite: R-TV 41 or 44 or permission of instructor. Individual and group laboratory experience in major productions for closed-circuit or broadcast distribution. (2 lab, 6–8 arranged hours)

128. Motion Picture Appreciation (2)
History and development of motion pictures; criteria for motion picture selection; use of reviews and judgment by critics and organizations; critical observation; evaluation. (2 lecture-lab and arranged hours)

129. Motion Picture Production (3)
Theory and techniques of film production. Laboratory practice in the basic uses of motion picture production equipment. Group and individual film projects. (2 lecture, 2 lab, and arranged hours)

140. Broadcasting and the Public (3)
Critical study of both the real and potential cultural, economic, and political impact of broadcasting; factors which shape the structure, standards, and procedures of broadcasting.

141. Broadcast and Film Writing (3) (Former R-TV 141A)
Prerequisite: R-TV 41 or 44 or permission of instructor. Continuity types; theory, writing, and evaluation of announcements, commentaries, and program formats; adapting the spoken word to the media.

142. Radio and Television News Broadcasting (3) (Same as Jour 142)
Prerequisite: R-TV 41 or 44 or permission of instructor. Characteristics of electronic news media; local and national broadcast news operations; news sources and resources; social influence; policy and control; planning and producing news and public affairs programs. (2 lecture, 2 lab, and arranged hours)

143. Producing the Educational Broadcast (3) (Same as A S 143)
Objectives and uses of radio and television in education; place of radio and television in the curriculum, classroom utilization; advantages and limitations of the media; evaluation of school broadcasts; program production experiences. (2 lecture, 2 lab hours)

144. Advanced Television Production (3)
Prerequisite: R-TV 44 or permission of instructor. Development of creative and critical skills; study of production theory and practice; participation in organization, planning, and production activities. (1 lecture, 4 lab hours)

147. Directing the Broadcast Program (3; max total 6)
Prerequisite: R-TV 41 or 44, permission of instructor. Theories and practices in producing and directing radio and television programs; planning and production for the directorial function. Laboratory goal to create airworthy products for closed-circuit or broadcast distribution. (1 lecture, 4 lab and arranged hours)

149. Advanced Broadcast Performance (3)
Prerequisite: R-TV 25, 41 or 44, or permission of instructor. Theories of performance in cinema and broadcasting; refinement of professional skills and standards; laboratory, closed-circuit or broadcast performance. (2 lecture, 2 lab and 2 arranged hours)

160. Broadcast Regulation (3)
Prerequisite: R-TV 40 or permission of instructor. Theories of mass communication control and their application to the electronic media. Development of regulatory patterns in U. S. broadcasting; social responsibility of the broadcaster.

170. Cinematography (3)
Prerequisite: R-TV 129 or permission of instructor. Advanced study of problems of camera and sound; production organization and equipment; laboratory projects in film production. (2 lecture, 2 lab and arranged hours)

173. Philosophy and Theory of Educational Broadcasting (3)
Theoretical constructs essential to broadcasting for instruction; student development of relevant and contemporary philosophy of broadcasting and its potential in education.

181. Radio-TV-Cinema Script (3) (Former R-TV 141B)
Prerequisite: R-TV 141 or permission of instructor. Study of content and writing techniques in scripts for radio, television and cinema; development of creative projects.

185. Proseminar in Station Management (3) (Former R-TV 145)
Prerequisite: R-TV 160, permission of instructor. Organization, programming, and operation of radio and television stations; correlation of department functions.

188T. Topics in Broadcasting (3; max total 9)
Selected timely and relevant topics of study including broadcast measurement and evaluation, media criticism, economics, broadcasting in politics, film editing, international broacasting, documentary programming.

189. Projects in Production (2; max total 6)
Prerequisite: senior standing, permission of intructor. Creative group projects in broadcasting or film; public showing or distribution of product required. (6–8 hours arranged)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

200 series.
Graduate courses are listed under *Special and Interdisciplinary Programs—Mass Communication.*

IN-SERVICE COURSES

(See *Course Numbering System*)

305T. Topics in Radio-TV-Cinema (1–3; repeatable with different topics)

THEATRE ARTS DEPARTMENT

Professors: Lombard, Loring, McGuire, P. Walker

Associate Professors: G. Graham (Chairman), J. Bryon, Randall

Assistant Professors: D. Briggs, Ellingwood, Emanuel, R. Johnson, T. Miller, Ryan, R. Smith

Part-time: Paynter

The Theatre Arts Department offers majors for those who seek professional qualifications in one or more of the theatre arts. It provides training for actors, directors, designers, teachers, technicians, playwrights, and historians. Students may choose, with guidance, areas of experience to satisfy special needs. For those who intend to make teaching their profession, the department offers programs for both the elementary and secondary teaching credentials. A master of arts degree is available (consult departmental adviser).

SPEECH TEST

For credential candidates. See *General Information—Entrance Examinations.*

MAJOR AND MINOR IN THEATRE ARTS

The theatre arts major and minor are designed to provide competencies in the theatre arts for students who intend to pursue study beyond the bachelor of arts degree, who are preparing for careers in secondary teaching or for the professional theatre. With the assistance of their advisers and with departmental approval, students may, by proper selection of electives, prepare themselves for service in one or more of the following specializations: acting/directing, arts administration, dramatic literature and theatre history, child drama, oral interpretation, technical/design, elementary or secondary teaching credential. These patterns of development should be determined in consultation with advisers.

MAJOR

Drama	*Units*
Drama 15–115, 22, 31, 33, 63, 34–134	23
Approved electives (Credential candidates must include Drama 137)	24
	47

Special Requirements: (Students majoring in theatre arts are advised to enroll in no more than two production courses per semester.)

1. Audition for each departmental production and accept any role or production responsibility assigned. (May be waived only by written consent of a majority of the theatre arts faculty.)
2. Obtain specific approval from the department chairman for participation in nondepartmental production activities, extra-curricular, or noncollege responsibilities. Majors are expected to be available for full participation in departmental production activities.

MINORS

Drama	*Units*
Drama 31	3
Drama 15–115, 33, 34–134, 133	11
Approved electives	6
	20

CREDENTIAL PROGRAM

For information on the current credential program consult departmental advisers and School of Education, Advanced Studies Department. See the section on *Public School Credentials.*

MASTER OF ARTS DEGREE IN SPEECH ARTS

The graduate program for the master of arts degree in speech is based on the equivalent of the undergraduate major or minor in theatre arts at Fresno State. From 18 to 24 of the 30 units required for the degree must be in speech. For specific requirements, consult the head of the department; for general requirements see *School of Graduate Studies* and the *Graduate Bulletin.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area III:* Drama 15, 22, 33, 34, 62, 115, 122, 137, 138, 139, 184, 185, 186, 187. *Area V:* Drama 188T. (See *General Education—Courses*)

COURSES

THEATRE ARTS (Drama)

15. Dramatic Arts Laboratory (1–2; max total 6)
Prerequisite: permission of instructor. Group laboratory experience in presentation of major productions for public performance. (4–8 hours arranged)

22. Fundamentals of Interpretation (3) (Former Spch 22)
Discovering and communicating intellectual and emotional meaning of the printed page through preparation and presentation of selected readings from prose, poetry, and drama.

31. Fundamentals of Voice and Articulation (3) (Former Spch 1, 20, Drama 1)
Primarily for students with majors and minors in the speech arts. Principles of voice and articulation with demonstration in various aspects of oral communication.

32. Stage Techniques (3)
Coordination, gesture, and stage business training for student actors, singers, and directors; development and improvement of creativity, awareness, and body control. (3 2-hour activity and 4 arranged hours)

33. Fundamentals of Acting (3)
Prerequisite: Drama 31 or permission of instructor. Fundamental techniques and theories of acting; development of individual insight, skill, and discipline in the presentation of dramatic materials. (3 2-hour activity and 4 arranged hours)

34. Theatre Crafts (3) (Same as IA 34)
Introduction to the crafts in technical theatre; scene construction, scene painting, property selection, stage lighting, sound production; costume construction and make-up; laboratory experience in preparing major plays for public performance. (3 lecture-lab and 9 arranged hours)

62. Critique of Theatre and Drama (3)
Not open to students with drama or theatre arts majors. Attendance and discussion of theatre productions, participation in staging and performing scenes. Critique of the various theatre arts.

63. Introduction to Dramatic Literature (3)
An introductory study of various types and styles of plays with respect to their form, meaning, and theatricality.

83. Touring Theatre (1–3; max total 6) (Same as Drama 183)
Prerequisite: permission of instructor. Experience in touring major productions for public performance.

89. Projects in Production (1–3; max total 9) (See Drama 189)

115. Advanced Dramatic Arts Laboratory (1–2; max total 9)
Prerequisite: permission of instructor. Group laboratory experience in presentation of major productions for public performance. (4–8 hours arranged)

122. Oral Interpretation of Literature (3) (Former Spch 122)
Prerequisite: permission of instructor. Analysis and communication of selected readings from prose, poetry, and drama.

123. Oral Studies in Poetry (3; max total 6) (Former Spch 123)
Prerequisite: Drama 22. Appreciation and communication of types of poetry, lyric, narrative, dramatic, emphasizing their differentiation for oral presentation; problems of content, structure, and style.

128. Oral Studies in Prose (3; max total 6) (Former Spch 128)
Prerequisite: Drama 22. Appreciation and communication of types of prose, emphasizing problems of content, structure, and style as they relate to oral presentation.

129. Oral Studies in Drama (3; max total 6) (Former Spch 129)
Prerequisite: Drama 22. Appreciation and communication of types of dramatic literature, emphasizing problems in structure and content from the point of view of the oral interpreter.

130. Choral Reading (3) (Former Spch 130)
Selection and presentation of literature appropriate for choral reading on various educational levels; role of choral reading in speech teaching.

131. Fundamentals of Playwriting (3; max total 9)
Play analysis, exploration of folk material, fundamentals of playwriting, critical analysis and revision of manuscripts, experimental production of completed scripts. (3 lecture-lab and arranged hours)

133. Advanced Acting (3; max total 6)
Prerequisite: Drama 33 or permission of instructor. Advanced techniques of emotion, timing, characterization, and style, developed by study and evolution of characters from the classic plays through the body of contemporary literature. (3 2-hour activity and 4 hours arranged)

134. Advanced Theatre Craft (3) (Same as IA 134)
Prerequisite: Drama 34 or permission of instructor. Advanced training in the crafts of technical theatre; preparing plays for major public performances. (3 lecture-lab and 9 arranged hours)

135. Make-up for Theatre (3)
Theory and practice of make-up for theatre; techniques for characterization, style, and technical processes; aesthetics, analysis of characters for make-up. Preparing plays for major public performances. (2-hour activity, 10 hours arranged)

136. Puppetry (3)
Introduction to the art of puppetry: history, construction of various types of puppets and theatre, practice in manipulation, script writing, use of puppets in education and recreation.

137. Creative Dramatics (2; max total 6) (Same as E Ed 137)
Basic techniques for the use of dramatization in elementary education; socio-drama, dramatization of school subjects, creative dramatic play; simplified staging techniques. (1 2-hour activity and 2 arranged hours)

138. Children's Theatre (3; max total 6) (Former Drama 159)
Theories of children's theatre and application to problems in production; preparing plays for major public performance. (1 3-hour activity and 9 hours arranged)

139. Fundamentals of Play Direction (3)
Not open to students with credit in Spch 133 prior to fall 1967. Prerequisite: Drama 33 or permission of instructor. Fundamental techniques and theories of stage direction; function, responsibility, movement, analysis, style; practice in directing scenes. (3 2-hour activity and 4 arranged hours)

140. Advanced Play Direction (3)
Prerequisite: Drama 139 or permission of instructor. Advanced techniques of play direction: prerehearsal problems and procedures; structural analysis of plays, composition, picturization, pantomimic dramatization, movement, rhythm. (3 2-hour activity and 4 arranged hours)

145. Women in the Theatre (3) (Same as W S 145)
Historical and contemporary perspectives and attitudes applied to women in the theatre arts including study of female artists, actresses, dancers, theatrical designers and technicians, directors and teachers.

150. Theatre Management and Promotion (3)
Principles of organization, operation, and administration of educational, community, and professional theatre; box office operation, accounting procedures, ticket manipulation, house management, fund raising, promotional media. Supervised practical experience in dramatic art area production.

155. Sound in the Theatre (3)
Theory, techniques, and procedure necessary to develop and integrate sound, music, and effects in theatre production; hearing, acoustics, environment, sources, transducers, control, systems, equipment; organization and planning. Laboratory experience in preparing plays for a major public performance. (3 2-hour activity and 6 arranged hours)

157. Theatre Graphics (3; max total 6)
Technical sketching, drafting working drawings, other graphic skills essential to the development of design for the theatre. (3 2-hour activity and 4 arranged hours)

175. Readers Theatre Direction (3)
Presentational elements in theatre, their effect in shaping readers theatre conventions. Fundamental techniques and theories of readers theatre. Selection and preparation of scripts, staging, practice in directing.

178. Oral Studies of Shakespeare (3) (Former Spch 178)
Prerequisite: Drama 22, 140, 185, or 186. Appreciation and communication of representative histories, comedies, and tragedies; problems of content and structure from the point of view of the oral interpreter.

179. Readers' Theatre (1–2; max total 6) (Former Spch 179)
Prerequisite: permission of instructor. Directed study of spoken literature for presentation resulting in a major public performance.

180A–B. Scene Design for Theatre (3–3) (Former Drama 180. Same as Art 180A–B)
Prerequisite: Drama 34 or 134 or permission of instructor. (A) Styles, techniques and methods of scene design; history. Laboratory application, material for major public performance. (Lab hours arranged) (B) Scenery design; design problems of a complicated play; experimental ideas; new materials. Laboratory application, material for major public performance. (Lab hours arranged)

181A–B. Costume Design for Theatre (3–3; 181B max total 6) (Former Drama 180. Same as Art 181A–B)
Prerequisite: permission of instructor. A. History of costume design; construction techniques; design project for an historical play. Construction of costumes for major public performance. B. Advanced design and history; design project. Laboratory application and work on a major public performance.

182A–B. Stage and Television Lighting (3–3) (Former Drama 180. Same as Art 182A–B)
Prerequisite: Drama 34 or 134 or permission of instructor. (A) Instruments, control, color, electro-mechanical factors and simplified design and planning lighting leading to and resulting in a major public performance. (Lab hours arranged) (B) Lighting as an art, design concepts; lighting plots, projections, sequential cue relationships. Laboratory application, material for major public performance. (Lab hours arranged)

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183. Touring Theatre (1–3; max total 6) (See Drama 83)

184. Readings in Dramatic Literature (3; max total 6)
Open to upper division students of all departments. Prerequisite: permission of instructor. Reading and discussion of great plays of history.

185. History of the Theatre and Drama I (3) (Former Drama 185A)
Prerequisite: upper division standing or permission of instructor. History of European theatre and component arts from ancient Greece through the mid-nineteenth century; analysis of representative examples.

186. History of the Theatre and Drama II (3) (Former Drama 185B)
Prerequisite: upper division standing or permission of instructor. From Ibsen to the present; analysis of representative examples.

187. History of the American Theatre (3)
Prerequisite: upper division standing or permission of instructor. History of the theatre in America from colonial times to the present; analysis of representative examples.

188T. Seminar: Topics in Dramatic Art (3; max total 9)
Prerequisite: permission of instructor. Selected topics may include: acting, children's theatre, creative dramatics, play direction, technical theatre, theatre history, dramatic literature.

189. Projects in Production (1–3; max total 9) (Same as Drama 89)
Prerequisite: permission of instructor. Group projects in all phases of production in laboratory theatre. (4 hours activity)

190. Independent Study. (1–3; max see reference)
See *General Information—Independent Study.*

194T. Major Writers: Shakespeare (4) (See Engl 189)

200 series. Graduate courses are listed under *Communicative Disorders and Speech.*

SCHOOL OF SOCIAL SCIENCES

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SCHOOL OF SOCIAL SCIENCES

Charles F. Denton, Dean

Department	*Chairman*
Anthropology	Sydney R. Story
Economics	Izumi Taniguchi
Ethnic Studies Program	
Black Studies	Lester Riggins (Coordinator)
La Raza Studies	Alexander Saragoza (Coordinator)
Geography	Richard C. Montgomery
History	Peter J. Klassen
Political Science	John A. Rotstan
Sociology	S. John Dackawich
Speech Communication	Ralph L. Hennings
Urban and Regional Planning	Harold H. Tokmakian

The School of Social Sciences offers a variety of degree, credential, and certificate programs at both the undergraduate and graduate levels. Students should familiarize themselves with these programs as they are presented by the departments on the succeeding pages. The School is strongly committed to its share of the traditional liberal arts education and has a varied and strong participation in the all-college general education program. Attention to the new and innovative is all-pervasive and continuous throughout the departments and programs. Professional employment preparation is available for nongovernmental situations and for service in public and private education as well as city, county, state, federal, and other governmental services. Preparation for graduate study and professional degrees is a concern of the school's departments and programs.

The School engages in many interdisciplinary programs (see *Special and Interdisciplinary Programs*). Special attention is invited to the social science major as employed in obtaining elementary and secondary teaching credentials and in prelegal training. Faculty and students of the school are involved in community services, research, and other professional activities. The faculties of the various departments engage in credit and noncredit offerings through the Extension Program (see *Extension Bulletin*).

ANTHROPOLOGY DEPARTMENT

Professor: W. Beatty
Associate Professors: Story (Chairman), van der Elst
Assistant Professors: Bowen, Jen, Jennings
Lecturer: Mounday
Part-time: Wren

The department offers a major for the bachelor of arts degree in anthropology and a minor for students majoring in other departments. The major is designed to provide a broad liberal arts background, as well as an adequate basis for graduate education.

The department cooperates with other departments in providing for a concentration in Asian Studies and Latin American Studies. (See *Special Programs—Asian Area Courses, Latin American Studies*)

MAJOR

The following degree major requirements are in addition to general education requirements.

Anthropology	*Units*
Anth 1, 2, 3, 104, 115	15
Anthropology electives, upper division	18
Elementary statistics, Ling 135, Biol 120	9
	42

MINOR

The following minor requirements are in additon to the general education requirements.

Anthropology	*Units*
Anth 1, 2, 3, 104	12
Electives in anthropology, upper division	9
	21

CREDENTIAL PROGRAM

For information on the current credential program consult the departmental advisers and the School of Education; see the section on *Public School Credentials.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements: *Area I:* Anth 1. *Area II:* Anth 2, 3, 102, 103, 104, 109, 114, 120, 122, 123, 124, 125, 126, 131, 150T. (See *General Education—Courses*)

COURSES

ANTHROPOLOGY (Anth)

1. Introduction to Physical Anthropology (3)
Relation of man and the animals; evolution of man, fossil man, race and racial classification; racial theories.

2. Introduction to Cultural Anthropology (3)
The nature of culture; culture growth and history; survey of cultural phenomena; cultural theory; applied anthropology.

3. Introduction to Prehistory (3)
Prerequisite: Anth 2. Development of archaeology and its basic concepts; general sequences of cultural development in the Old and New Worlds.

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4. Introduction to Linguistic Anthropology (3)
Prerequisite: Anth 2 or permission of instructor. Linguistic influences on anthropological theory. Linguistic models in anthropology. Language in human evolution. Infrahuman communication systems.

102. Ethnology (3)
Prerequisite: Anth 2 or permission of instructor. Major theories of culture; survey of culture types and their distribution; culture history.

103. Anthropology of Modernization (3)
Prerequisite: Anth 2 or permission of instructor. Acculturation studies; impact of western civilization upon nonwestern societies.

104. History and Theory of Anthropology (3)
Prerequisite: Anth 2 or permission of instructor. The place of anthropology in the social sciences; theories and schools in social anthropology; community studies, integration, functionalism, psychological aspects, neo-evolution.

109. Seminar in Theory of Prehistory (3)
Prerequisite: Anth 2, 3, or permission of instructor. Current problems of prehistory, application to anthropology; theoretical approaches to archaeology.

110. Archaeological Methods (4)
Prerequisite: Anth 109 and elementary statistics. Detailed examination of the basic data collection, analytical, and interpretive techniques of archaeology. Application of these techniques to the solution of specific archaeological problems. (3 lecture, 3 lab hours)

111. Field Archaeology (3; max total 9)
Prerequisite: Anth 110 and permission of instructor. Practical work in anthropological field research; participation in excavation and/or reconnaissance projects in the Fresno area. (8 hours on Saturday)

112. Comparative Social Organization (3)
Prerequisite: Anth 2 and either Anth 104 or permission of instructor. Cross-cultural sampling of organizational variability from kin-grouping through bureaucracy, from band egalitarianism to mass stratification. Culture and complexity; principles of kinship, specialization, institutionalization, and change.

113. Introduction to Psychological Anthropology (3)
Prerequisite: A grade of C or better in Anth 2; plus either Anth 1 or Psych 10, or permission of instructor. Culture and personality, stress, and perception. Enculturation for different roles, strata, and societies. Autonomy, worldview, perception, and cognition.

114. Seminar in Psychological Anthropology (3)
Prerequisite: Anth 113 or permission of instructor. Influence of culture on perception, motivation, decision-making, autonomy, and personality. Directed library research and reports. Cross-cultural analyses of socialization, relative and absolute deviance, value alternatives, and related topics.

115. Seminar in Cultural Anthropology (3)
Prerequisite: Anth 2, 104. Method and theory in cultural anthropology; reading and analysis of major contributions to modern cultural anthropological thought.

116. Problems in the Definition of Man (3)
Prerequisite: Anth 2 and upper division standing, or permission of instructor. A scientific and philosophical examination of human nature. Comparison of behavioral and social aspects of human and animal societies; discussion of relevant evidence and concepts drawn from several disciplines.

120. Peoples and Cultures of North America and Meso-America (3) (Same as NAS 120)
Prerequisite: Anth 2 or permission of instructor. American Indian peoples and cultures north of the Isthmus of Panama.

121. Peoples and Cultures of South America (3)
Prerequisite: Anth 2 or permission of instructor. South American cultures from the contact period to the present; emphasis on cultural ecology and historical change.

122. Peoples and Cultures of the Pacific Islands (3)
Prerequisite: Anth 2 or permission of instructor. The peoples of Polynesia, Melanesia, and Micronesia. Migration theories; contemporary social and political systems; European contacts and culture change.

123. Peoples and Cultures of Southeast Asia (3)
Prerequisite: Anth 2 or permission of instructor. The peoples and culture of Southeast Asia.

124. Peoples and Cultures of East Asia (3)
Prerequisite: Anth 2 or permission of instructor. The peoples and cultures of China, Japan, and Korea.

125. Peoples and Cultures of the Middle East (3)
Prerequisite: Anth 2 or permission of instructor. Historical backgrounds and contemporary cultures of the Middle East.

126. Peoples and Cultures of Africa (3)
Prerequisite: Anth 2 or permission of instructor. Historical backgrounds and contemporary cultures of Sub-Saharan Africa; modern social forces and cultural change.

127. Cultural Adaptations of the New World Negro (3)
Prerequisite: Anth 2 and either 126 or permission of instructor. The cultural continuum from tribal societies through peasantry to urbanization. Examination of culture-historic factors such as slavery, stratification, change.

130. Meso-American Prehistory (3)
Prerequisite: Anth 3 or permission of instructor. Evolution of native New World cultures from hunting and gathering to the rise of theocratic states in the area between northern Mexico and the Isthmus of Panama.

131. North American Prehistory (3)
Prerequisite: Anth 3 or permission of instructor. Archaeology of native American culture in what is now known as Canada, the United States and northern Mexico.

132. South American Prehistory (3)
Prerequisite: Anth 2, 3, or permission of instructor. Aboriginal cultural developments south of the Isthmus of Panama from Early Man to the Spanish Conquest. Special emphasis is given to the high cultures of the Andean region.

133. Old World Prehistory (3)
Prerequisite: Anth 3 or permission of instructor. Archaeology of Europe, the Near East, and Saharan Africa from the Paleolithic through the Neolithic, with emphasis on the relationship between environment and culture.

140. Political Anthropology (3)
Prerequisite: Anth 2 or permission of instructor. Comparison and analysis of political structure, behavioral organization and operational systems among selected peoples at the aboriginal and local level. Emphasis on leadership, authority, power, and forms of primitive government, relevance of primitive political behavior and organization to anthropology theory.

145. Comparative Religion (3)
Prerequisite: Anth 2 or permission of instructor. Religious systems of nonliterate, peasant, and sectarian groups; anthropological theories of religion and magic.

150T. Seminar in Anthropology (3; max total 9)
Prerequisite: permission of instructor. Subspecialties current in anthropology: e.g., ethnoscience, cultural ecology, human population genetics.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

192. Directed Readings (1–3)
No more than 12 units may be counted toward major. Directed readings in a selected field of anthropology.

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ECONOMICS DEPARTMENT

Professors: Mullenix, Spangler

Associate Professors: Taniguchi (Chairman), Allison, Bush, Minick, Shaw, Terry

Assistant Professors: Cypher, Niggle, Pisciottoli, Reeder

Part-time: Francis

The Economics Department prepares students to fill the role of citizens well informed on the economic problems confronting a modern society. Majors in economics are offered training for careers in government, business, and the teaching profession. Those going on to graduate work are given training in sufficient depth and breadth to enable them to pursue their studies in satisfactory fashion.

The department cooperates with other departments in providing for a concentration in Asian Studies (See *Special Programs—Asian Area Courses*)

ECONOMICS MAJOR

The following bachelor of arts degree major requirements are in addition to the general education requirements. Econ 1A and 1B are prerequisite to all upper division courses in economics except those offered in extension. Any student planning graduate work is advised to take some calculus and econometrics and to meet any foreign language requirement of the school he plans to attend.

	Units
Econ 1A–B, 100A–B, 120	16
Economics electives (at least 14 units upper division)	18
	34

ECONOMICS MINOR

The minor in economics requires 18 units as listed below; 20 units are required for use in a credential program.

	Units
Econ 1A–B	6
Elect from: Econ 100A, 100B, 101	3
Economics electives (11 units required for credential program)	9–11
	18–20

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in economics does not require an undergraduate major in economics. For specific requirements, consult the departmental chairman or the graduate committee; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State College, see the *Graduate Bulletin,* available in the Office of the Dean, School of Graduate Studies.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area II:* Econ 1A, 1B, 10, 15, 101, 102T, 110, 111, 151, 165, 180. (See *General Education—Courses.*)

COURSES

ECONOMICS (Econ)

1A. Principles of Economics (3)

Introduction to macro-economics; levels of income, production, employment; economic role of government and banking system in the United States.

1B. Principles of Economics (3)
Introduction to micro-economics; price determination via supply and demand; resource allocation under pure competition, monopolistic competition, monopoly, oligopoly; fundamentals of distribution theory and international trade.

10. Principles of Political Economy (3)
Prerequisite: permission of instructor. Principles of political economy; political nature of applications of economic theory. Oral presentation of papers required.

15. Development of the American Economy (3)
European background; evolution of market capitalism; development of American economic institutions; recent trends and economic issues.

100A. Economic Theory: Price Analysis (3)
Prerequisite: Econ 1A–B. Price mechanism and resource allocation under conditions of pure competition, monopolistic competition, oligopoly; theories of consumer's choice, cost, production, income distribution; nature of economic generalizations.

100B. Economic Theory: National Income Analysis (3)
Prerequisite: Econ 1A–B. Classical, Keynesian and post-Keynesian theories on level of income and employment; elements of national income accounting, flow-of-funds analysis; relationship of rate of interest to level of investment; alternative theories of inflation; warranted rates of economic growth.

101. History of Economic Thought (3)
Prerequisite: Econ 1A–B. Evolution of economics as a science; doctrines of different schools of thought—Mercantilists, Physiocrats, Historical School, Classical Economists; contributions of outstanding economists.

102T. Contemporary Economic Problems (3; max total 6)
Prerequisite: upper division standing and permission of instructor. Analysis of economic problems and issues which are of public interest and importance at the time the course is given.

103. Economic Fluctuations (3)
Prerequisite: Econ 1A–B. consideration of the following topics: some general behavioral characteristics of business cycles; some simple economic cyclical models; current political and/or economic events relating to business cycle behavior.

105. Marxian Economic Theory (3)
Prerequisite: Econ 1A–B or permission of instructor. Marxian economic theory and its relevance for modern economic theory and analysis; Marx's value, production and distribution theory; modern developments of Marxian models.

107. Institutional Economics (3)
Prerequisite: Econ 1A–B or permission of instructor. Study of the literature of American institutionalism, e.g., Veblen, Commons. Systematic study of the process of institutional adjustments; interplay of ceremonial and technological aspects of economic activity; application of institutionalist theory to specific fields in economics.

108. Radical Traditions in Economics (3)
Prerequisite: Econ 1A–B or permission of instructor. Economic philosophies of the Utopian, Anarchist, Anti-Materialist, Marxist, and Fabian Socialist schools. Intensive examination of contemporary radical economic ideas and the radical critique of modern neo-classical economics.

110. Economic History of the United States (3)
Prerequisite: Econ 1A–B. Exploration and colonization to the present; economic factors in development of the United States; relationships of economic forces to historical, political, and social change.

111. Economic Development of Europe (3)
Prerequisite: Econ 1A–B. European expansion, fifteenth century to the present; present economic conditions and trends in Europe; interest of United States in European economy.

114. Economics of Underdeveloped Areas (3)
Prerequisite: Econ 1A–B or permission of instructor. Survey and analysis of developmental problems of emergent economies.

115T. Topics in US Economic History (1–3; max total 3)
Detailed investigation of developments in the United States economy. Topics vary with the needs and interests of students and faculty.

117. Economics of Ecology (4)
Prerequisite: Econ 1A–B or permission of instructor. Investigation into the economics of resource use. Development and creation of resources through the application of technology and the destruction of resources through misuse and pollution of the environment.

119. Regional Economic Analysis (3)
Prerequisite: Econ 1A–B or permission of instructor. Techniques of economic analysis of geographic regions; study of differing definitions of a region, economic base studies, input-output analysis, location theory, and multiplier analysis.

120. Economic Statistics (4)
Prerequisite: Econ 1A–B and Math 29 or equivalent. Introduction to the use of statistics in economics; consideration of measures of central tendency and dispersion, index numbers, time series analysis, tests of hypotheses and simple regression analysis. (3 lecture, 2 lab hours)

121. Elementary Econometrics (3)
Prerequisite: Econ 120. Study of the application of regression models to economics with consideration of statistical problems encountered. Topics will include measurement of the multiplier and monetary-fiscal policy effectiveness.

125. Mathematical Economics (3)
Prerequisites: Econ 1A–B; mathematical competency at the high school algebra level. Presentation of some elementary calculus and its application to neoclassical theory, plus difference equations and their application to some simple dynamic models.

131. Public Finance (3)
Prerequisite: Econ 100A or permission of instructor. Governmental revenues and expenditures at federal, state, and local levels of jurisdiction.

134. Financial History of the United States to 1913 (3)
Prerequisite: Econ 1A–B or Econ 15. Analysis of fiscal and monetary institutions before the enactment of the Federal Reserve Act.

135. Money and Banking (3)
Not open to students with credit in Fin 135. Prerequisite: Econ 1A–B or permission of instructor. Survey of the monetary and banking system of the United States and analysis of its role in economic growth and stabilization.

136. Monetary and Fiscal Policy (3)
Prerequisite: Econ 1A–B or permission of instructor. An examination of monetary and fiscal policy as tools for influencing economic growth and stability.

150. Labor Economics (3)
Prerequisite: Econ 1A–B or permission of instructor. Alternative theories of wages, employment and structure of labor market; impact of collective bargaining on level of wages, employment and labor's share of national income; history and philosophies of labor movement, structure and functioning of labor unions.

151. History of Labor in the United States (3)
Prerequisite: Econ 1A–B or permission of instructor. Analytical topics from historical viewpoint; evolution of unions and labor legislation interpreted in terms of economic theory.

162. Medical Economics (2)
Prerequisite: Econ 1A–B or permission of instructor. Examination of several aspects of the health care situation in the United States from the viewpoint of economic analysis.

165. Political Economy of Education (3)
Prerequisite: Econ 1A–B or permission of instructor. General approach to scope, method, and goals of resource utilization in education. Research papers and class presentations of results required.

170. Transportation (3)
Prerequisite: Econ 1A–B or permission of instructor. Economics of rail, water, motor, air, and pipeline transportation.

174. Government Regulation of Economic Activity (3)
Prerequisite: Econ 1A–B or permission of instructor. Justification for regulation, constitutional limitations, public utility regulation, regulation of monopoly; competitive practices; government policy in other areas of economic activity.

178. International Economics (3)
Prerequisite: Econ 1A–B or permission of instructor. International economic relations; problems and policies in the light of fundamental economic theory.

179. Imperialism (3)
Analysis of the development and extension of imperialistic behavior since the Industrial Revolution. Examination of economic literature on imperialism from Hobson to the present.

180. Comparative Economic Systems (3)
Prerequisite: Econ 1A–B or permission of instructor. Comparative study of economic systems of the modern world; capitalism, socialism, communism, fascism, and the problems which arise within each.

181. Political Economy of Central Planning (3)
Prerequisite: Econ 1A–B or permission of instructor. Theory, history, and institutional application of central planning; examination of existing centrally planned economies, feasibility of central planning in the underdeveloped economies, welfare criteria for nonmarket economies.

185. Directed Readings (1–3)
Prerequisite: Econ 1A–B and permission of instructor. Directed readings in the literature of economics. Intensive reading of economic literature on special topics under faculty supervision.

188T. Special Topics (1–3; max total 6)
Prerequisite: Econ 1A–B or permission of instructor. Consideration in depth of special topics in political economy; systematic, detailed study into issues not possible in survey courses. Topics vary with the needs and interest of students and faculty.

189T. Topics in Public Policy (1–3; max total 3)
Prerequisite: Econ 1A–B or permission of instructor. Detailed analysis of questions of economic policy. Areas of investigation include social welfare policy, farm policy, environmental quality policy, and others. Topics to be varied with the interests and needs of students and faculty.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

Note: A master's degree in economics requires the completion of at least 4 units in Econ 200T, at least 4 units in Econ 220T and at least 2 units in either Econ 298 or 299.

200T. Seminar in Economic Theory (4; max total 8) (Former Econ 201)
Consideration of advanced theoretical propositions in micro and macro economic theory.

210T. Seminar in Economic History (4; max total 8) (Former Econ 210)
Critical examination of, and reports on, selected topics in economic history.

220T. Seminar in Research Methodology (4; max total 8) (Former Econ 200)
Development of deductive and inductive quantitative inference techniques in economics.

230T. Seminar in Monetary and Fiscal Economics (4; max total 8) (Former Econ 230)
Examination of advanced topics in the operation of the government and the money system.

240T. Seminar in Urban and Regional Economics (4; max total 8)
Issues and analytic techniques of regional economics and survey of empirical literature. Independent study with subject matter and technique determined by preparation and professional objectives of student.

250T. Seminar in Labor Economics (4; max total 8) (Former Econ 250)
Advanced topics in employment theory, trade union philosophy, and collective bargaining.

260T. Seminar in International Economics (4; max total 8) (Former Econ 278)
Preparation of papers and oral reports on current problems in international trade.

274T. Seminar in Industrial Organization (4; max total 8)
Consideration of effects of industrial organization on the functioning of an economy.

280T. Seminar in Economic Policy (4; max total 8)
Examination of problems and issues in formulating and implementing economic policy.

285. Directed Reading (1–4)
Reading list compiled in consultation with graduate adviser, not necessarily of the specialized nature required for independent study.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

298. Critique (2–6)
The preparation, completion, and submission of a paper showing proficiency in some significant problem or area in economics.

299. Thesis (2–4; max total 4)
Prerequisite: See *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

ETHNIC STUDIES PROGRAM

The Ethnic Studies Program at Fresno State is designed to promote academic and professional knowledge of, and sensitivity to, historical and cultural developments important to ethnic groups in the United States. Offered through the program are courses in Armenian Studies, Asian-American Studies, Black Studies, La Raza Studies, and Native-American Studies, as well as courses of more general and comparative nature. Many of these courses are included in the Social Science Major.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* Bl S 42. *Area II:* Arm S 60, 110, 133; As Am 15, 30, 56, 110, 115, 140, 150; Bl S 36, 38, 131, 132, 135, 143, 145; La R 5, 6, 133; N A S 50, 103, 120. *Area III:* Arm S 181; Bl S 25, 27, 35, 125; La R 7, 9, 101, 108, 120, 130, 132; N A S 80, 100, 101. *Area IV:* La R 12, 40A–B. *Area V:* Arm S 30T, 120T; Bl S 33, 144, 147, 148, 151, 178; La R 183.

COURSES

ETHNIC STUDIES (Eth S)

1. Ethnic Experience (3)
Comparative study of the situations of ethnic minorities in the United States, combining the perspectives of history, sociology, and psychology.

2. Ethnic Expression (3)
Comparative study of the characteristic ways in which ethnic minorities in the United States think and feel about themselves and the world, as reflected in literature, art, and music.

ARMENIAN STUDIES

Professor: Avakian

COURSES

ARMENIAN STUDIES (Arm S)

30T. Topics in Armenian Studies (3; max total 6)
Classical Armenian literature, modern Armenian literature, Armenians of the dispersion, Armenian art, Armenian music.

60. Cultural Heritage (3)
Evaluation of the cultural background and history of the Armenian people from earliest days as a nation to the present.

110. Armenian Church History (3) (Former Arm S 109T)
Religious history of Armenians covering the pagan period, the founding of Christianity in Armenia, the doctrinal and Christological position of the Armenian Church.

120T. Topics in Armenian Studies (3; max total 6)
Prerequisite: reading knowledge of Armenian. Armenian church liturgy, advanced classical Armenian literature, advanced modern Armenian literature.

133. Armenian History (3) (See Hist 133)

161. Armenian Research (3; max total 6)
Aspects of recent Armenian history relating to the socio-ethnic development of Armenians in the dispersion, with special emphasis on the narrative and facts of the 1915 genocide.

181. Armenian Church Architecture (2)
Study and analysis of the architecture of Armenian churches covering the general idiom, the construction, and the ornamentation.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

ASIAN-AMERICAN STUDIES

Lecturer: Tsuji

COURSES

ASIAN-AMERICAN STUDIES (As Am)

10. Asians in America (3)
Historical and contemporary situation of Asians in America; Japanese and Chinese in the United States.

15. Asian-American Status and Identity (3)
Japanese and Chinese youth; their role as a minority, questions of self-identity in an atmosphere of "white" values, and influences of the traditional oriental culture. Social and psychological concepts.

30. The Japanese-American in the United States (3)
Historical and sociological development of the Japanese-American in the United States. Racial stereotypes of the Issei, Nisei, and Sansei; their values, degree of marginality, assimilation, and acceptance into American society.

56. The Chinese-American in the United States (3)
Historical survey of family heritages, social traditions, and cultural patterns of Chinese-Americans and their adaptation to American life.

90T. Topics in Asian-American Studies (3; max total 6)
Social and historical approach to the Asian-American experience in the United States. Special emphasis on the contemporary situation of Asians in America, including community knowledge and involvement.

110. Asian-American Race Relations (3)
Comparative study of Asian minorities in the United States; race contact, culture change, and adaptation.

115. Chinese-American Social-Behavioral Systems (3)
Social-cultural and behavioral patterns of the Chinese-American in the United States; their operational systems in American culture.

140. The Wartime Relocation of the Japanese (3)
WW II relocation of Japanese from the points of view of the internees; evacuation, responses by the Japanese, legality of the relocation, effects upon three generations of Japanese-Americans.

150. Seminar in Japanese-American Studies (3)
Selected topics within the sphere of Japanese-American studies; evaluation, analysis, and criticism of the materials and topics presented.

180T. Topics in Asian-American Studies (3; max total 6)
In-depth research and writing on the past and contemporary situation of Asian Americans.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

BLACK STUDIES

Associate Professor: S. Williams

Assistant Professor: Bessard, W. H. Brooks, Riggins (Coordinator)

Lecturer: Pangulula

Part-time: W. G. Brooks, Daw, De Lemos, L. Johnson, Mikell, Small, Walker

COURSES

BLACK STUDIES (BI S)

20. Black Drama and Dance (3)
Comprehensive study of the nature of Black drama and dance and its relation to society. Performing plays, dances, and dramas written by Blacks. Emphasis on communicative functions of Black drama and dance, technical and theoretical.

22. Black Dialect (3)
Linguistic course designed to explore the origin, impact, historical background, and problems created by Blacks in using the Black dialect derivative of English and the African language.

25. Black Literature (3)
Major authors, their works, themes and movements in Black literature in America from colonial times to the present.

27. The Black Image (3) (Former BLST 22)
Analysis of Black roles as they have appeared in American Literature from slavery through the American romantic period to the present.

30. History of Civil Rights (3)
History of the Civil Rights movement in the United States; influence of the movement on practical life (Black-White) in the United States. Special emphasis on analysis of problems concerning Civil Rights Activists throughout the century.

33. African Tribal Life (3)
Aspects of African tribal backgrounds and their relationships to Black experience in America.

35. Art and Music of Africa (3)
Comprehensive study of African artistry and music.

36. Contemporary African Societies (3)
Evaluation and analysis of cultural structures of the Black nations of Africa and their relation to Black life in America.

38. Ethnic Sociology (3)
Basic principles of sociology from the perspective of the Black experience.

40. Introduction to African Languages (3)
History of the formation, location, and similarity of the major African languages.

42. Ethnic Psychology (3)
Evaluation of concepts of general psychology and personality theory; relevance and applicability to behavioral patterns within the American Black community.

60. Introduction to Contemporary African Literature (3)
Survey of the general characteristics, main currents, and representative works by contemporary African authors writing in English and French; African novels, poetry, drama, and oral literature.

125. Advanced Black Literature (3)
Major authors of the 1920's and their contribution to American Literature: Rudolph Fisher, Jean Toomer, Claude McKay, James Weldon Johnson, Countee Cullen, Langston Hughes, Arna Bontemps.

127. Black Literature (3) (Former Bl S 133)
Prerequisite: Bl S 25 or permission of instructor. Themes in Black literature: discussion and close written analysis of major themes and their background.

130T. Topics in Black Studies (3; max total 9)
Major social problems confronting Blacks in America today; emphasis on welfare, education, legal systems, religious institutions, and economic institutions; effect on the Black segment of the population.

131. Revolutionary Process in Black Africa (3) (Former BLST 31)
An in-depth exposition of past colonial nationalism in Black Africa.

132. Economy of Black Africa (3) (Former BLST 32)
Study of the various economic structures and problems of the emerging Black nations of Africa.

135. American Black Ghettos (3)
Analysis of the various life styles and cultural patterns of the large Black ghettos of America.

140. Sociology of Religion in the Black Community (3)
History of the formation and development of Afro-American religious institutions (Christianity, Islam, Judaism) in the Black community; their effect on the Afro-American personality.

143. Psychology of Race Roles (3)
Prerequisite: Bl S 42 or permission of the instructor. Group dynamics through the examination of various psychological roles the Black man assumes or falls heir to in his struggle to cope with the exigencies impressed upon him by a white environment.

144. Seminar on Race Relations (3)
Tactics, strategy, and behavior used in the resolution of racial conflict; philosophical and psychological investigation involving analysis of the past and projection for the future.

145. The Black Man and the World (3)
Experience and status of the Black man in the numerous Black colonies of the non-Black world.

147. Black Community Relations (3)
Analysis of problems and strengths of the Black Community of Fresno; field work and placement in agencies providing services to the West Fresno community.

148. Minority Business Management (3)
Minority business problems in the Black community.

149. Minority Consumer Economics (3)
Study of consumer economic organizations, emphasis on selection of the structure best suited to minority needs and conditions; personal and group financial situations of the minorities, services of the financing companies.

150. Problems in Ghetto Schools (3)
Problems inherent in ghetto schools with emphasis on the family, community, and socio-economic factors which determine the quality of educational programs and experiences; their effect on Black values, schools, and community.

151. African Tribal Life and American Culture (3) (Former BLST 150)
Study of African music and dances. Comparison and contrast of the Black experience in Africa and America as exemplified in the respective cultures.

160. Ghetto Rhetoric and Standard Speech (3)
Relationship of Black rhetoric and standard speech set in the context of both the ghetto and mass society; emphasis on use, meaning, and equation with English being taught in public schools.

170. Black Mass Communication (3)
Analytical study of the world of mass communication (radio, TV, film, journalism) from a Black perspective. Team teaching with students participating in various aspects of mass media production. (field trips)

178. History of Black Americans (3) (See History 178)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

LA RAZA STUDIES

Assistant Professor: Saragoza (Coordinator)
Lecturers: Martinez, Palomino, Perez, Salandini
Part-time: Nunez, Salinas

COURSES

LA RAZA (La R)

3. Issues in the Socialization of the Chicano (3)
Social, cultural, and psychological aspects of being a minority as reflected in the diversity of the Chicano and his self-concepts.

5. Chicano Culture (3)
Values, attitudes, and life concepts of La Raza; their origins.

6. Community Studies (3)
Factors involved in the dynamics of the Chicano community.

7. Chicano Art Forms I (3)
Traditional and contemporary art forms as they relate to Chicano art.

8. Aztlan (3)
Historical trends in the formation of a Chicano consciousness.

9. Chicano Art Orientation (3)
Literature, drama, and arts of the Chicano and their common themes: indianismo, social protest, self-discovery, liberation.

10. Chicano Writing I (3)
Basic concepts of literary forms and expressions through a beginning creative writing course involving Chicano themes.

12. English for Spanish Speakers (3) (See I S C 12)

40A-B. Spanish—Intensive Reading and Composition (3–3) (See Spanish 40A-B)

101. Advanced Chicano Art Forms (3)
Prerequisite: La R 9 or equivalent. Studio for advanced students.

102. Contemporary Chicano Art (3)
Prerequisite: La R 9 or equivalent. Study and appreciation of current Chicano artists.

103. Origins of Chicano Art (3)
Prerequisite: La R 9 or equivalent. Influences on Chicano art from pre-Columbian motifs to the Mexican muralists.

108. Chicano Writing II (3)
Prerequisite: La R 9 or equivalent. Advanced creative writing.

109. The Chicano and the Educational System (3)
Prerequisite: La R 3 or equivalent. Principal elements of the educational system and their effect on Chicano students.

112. Pre-Hispanic Civilizations (3)
Prerequisite: La R 5. Aspects of pre-Columbian cultures; their influence on the Chicano habits, customs, values, and behavior.

114A. La Raza 1845–1910 (3)
Prerequisite: La R 8 or equivalent. Interaction between La Raza and the cultures of the Southwest; development of La Raza during the period between Mexico's independence from Spain and the Mexican Revolution.

114B. La Raza 1910–Present (3)
Prerequisite: La R 8 or equivalent. Southwest after the Mexican Revolution; impact of Mexican immigration; attempts of the Mexican and his descendants to overcome oppression.

116. Movimiento (3)
In-depth treatment of the Chicano Movement through an historical analysis of its intellectual foundation and its evolution to the present.

118. La Familia (3)
Not open to students with credit in La R 125T, Mexican-American Family. Prerequisite: La R 3 or 5 or equivalent. Traditional and changing relationships in the family structure of the Chicano; interaction with wider institutional social system.

120. Chicano Folklore (3)
Prerequisite: La R 5 or equivalent. Stories, legends, dichos, and common practices of the Chicano, past and present.

121A-B. Music and Dance of La Raza (3–3)
La R 121B not open to students with credit in 125T, Advanced Mexican-American Folklore. Development and performance of Mexican folk music and dance; Indian, Negro, Spanish, and European influences; contemporary relationships to Chicano culture.

124. Vita Cotidiana (3)
History and culture. Private life and thought of the Chicano; male-female relationship, the family, machismo, drama, life-death syndrome, colloquial language and regional idioms, music, and literature.

125T. Topics of Mexican-American Society (3)
Culture, art forms, economy, and societal organization.

126. Economics of Chicano Farm Labor (3)
Numbers, distribution, income levels, output, relation to California economy.

130. Chicano Theatre (3)
Production of Chicano Theatre for major performances. *Comedia del Arte*, Passion Plays, Theatre of the Absurd, Socially Popular Theatre: *Teatro Compesino.*

132. Chicano Literature (3)
Emerging Chicano literature: poetry, novels, essays.

133. Contemporary Political Issues (3)
Prerequisite: La R 3, Pl Si 2, or equivalent. Political philosophies, goals, and strategies of Chicanos as reflected in their attempts to gain political power.

140. Economics of La Raza (3)
Prerequisite: Econ 1A or equivalent. Economics of the Chicano community and its relationship to the wider economic system.

142. Chicano Community: Issues and Development (3)
Prerequisite: La R 6 or equivalent. Exposure and analysis of the existing problems in the Chicano community in the Central Valley. Development of methods of problem solving.

143. Community Research (3)
Prerequisite: permission of instructor. Methods of scientific investigation and data collection; theories of research interviewing on issues affecting the Chicano community.

145. Field Work in Community Studies (3)
Prerequisite: La R 6 or equivalent. Observation, orientation, and participation in the operations of the Chicano community.

169T. Latin-American History (3) (See History 169T)

183. The Hispanic Southwest (3) (See History 183)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

NATIVE AMERICAN STUDIES

Part-time: Dunn, L. Martin

COURSES

NATIVE AMERICAN STUDIES (NAS)

9T. Topics in Native American Studies (1–3; max total 9 if no area repeated)
Selected topics at an introductory level in Native American studies.

50. Contemporary Life of the Native American (3)
Prerequisite: permission of instructor. Current problems of American Indians resulting from acculturation, minority status, and legislative action; detailed study of health, education, social welfare legislation, tribal leadership, and other areas.

60T. Topics in Indian Education (3)
Foundations and history of Indian education, methods of teaching Indian children, curriculum and practices for Indian education, guidance for the Indian student, problems of teachers of Indian children, education of Indian adults.

80. Native American Art (3)
Survey of architecture, sculpture, and painting of the American Indian.

100. Native American Indian Religion (3)
Religious systems of the American Indian, including beliefs, myths, the social structure of religion, types of ritual activities, and functions of religion in Indian societies as perceived by the American Indian.

101. Native American Indian Law (3)
Concepts of laws on Indian reservations, termination, litigation and complaints, strengthening tribal governments. Law related to Indian land and resources.

103. Indians of California (3)
Indians of California: population, customs, beliefs, arts of life.

109T. Advanced Topics in Native American Studies (1–3; max total 9 if no area repeated)
Prerequisite: permission of instructor. Selected topics at an advanced level in Native American studies.

120. Indians of North American and Meso-America (3) (See Anth 120)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

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GEOGRAPHY DEPARTMENT

Professors: Montgomery (Chairman), Cole, Crosby, Ervin, Koller, Nasse
Associate Professors: R. Lee, Markham, Norsworthy, M. Stuart
Assistant Professors: Biechler, Gauss, A. Johnson, Kus, Morgan, Sieve, Towle, Vander Meer
Lecturers: C. Lee, Thaung, Wage
Part-time: Gearhart

The Geography Department offers a major and a minor in geography for the bachelor of arts degree and a graduate program for the master of arts degree. Geography offerings include undergraduate preparation for careers in regional and urban planning (land use surveys, market area analysis); teaching; map intelligence, real estate, cartography, weather; and preparation for graduate work.

Geography, because it integrates much information from the social and natural sciences and because of the diversity of subject matter from which it obtains data, offers a broad, liberal education applicable to many fields of employment. Geography provides much insight of direct application to teaching various courses of study in the elementary and secondary schools.

The department cooperates with other departments in providing for a concentration in Asian Studies and in Latin American Studies. (See *Special Programs—Asian Area Courses, Latin American Studies*)

Five of the California State University and Colleges, including Fresno State, cooperate in the management of the Moss Landing Marine Laboratories on Monterey Bay, an establishment which offers regular course work and opportunities for research which are applicable to graduate and undergraduate programs. Consult the chairmen of the Geography and Biology Departments. See *Special Programs—Moss Landing Marine Laboratories;* for course descriptions see *Biology Department.*

BACHELOR OF ARTS DEGREE IN GEOGRAPHY

The bachelor of arts degree with a major in geography consists of 124 units, including 39 units of geography. See requirements listed below. For general degree requirements see *Degrees and Credentials.* Geography courses may not meet the social science general education requirement for geography majors. Students who intend to enter the graduate program at Fresno State should consult the following section, *Master of Arts Degree.*

GEOGRAPHY MAJOR

		Units
I.	Elect from: Geog 2, 3, 101, 102, 103, 104, 107, 116, 119T, 120, 130, 177	9
II.	Elect from: Geog 5, 7, 8, 105, 106, 108, 109, 110, 114, 171	6
III.	Elect from: Geog 111, 112, 113, 115, 135T, 181	6
IV.	Elect from: Geog 4, 124, 125, 126, 127T, 128T, 129T, 140, 141, 142, 143, 153T, 189, 193T	6
V.	Geography electives, upper division	12
		39

Recommended electives: Ag Ec 31, Plant 30, Biol 157, CE 3, Geol 105, 109, Anth 102, Bot 107, Econ 119, 170, Soc 163. May be substituted on Line V of the major with approval of the department chairman.

Geography Major—Elementary Education Option

In addition to the academic major in geography the department, in cooperation with the School of Education, offers an optional program designed for students interested in an elementary education credential. The option is structured to enable prospective teachers to complete State of California minimum credential requirements in four years, and thereby begin teaching with a partial fulfillment certificate. The fifth year must be completed within seven years after graduation in order to qualify for the standard teaching credential, as required by the state. The major consists of 36 units of geography and 24–25 units of elementary education courses. Since the program is designed specifically for teachers and does not conform to the regular academic major, it is not considered satisfactory preparation for graduate work in geography.

	Units
Geog 2, 3, 5, 7	12
Elect one course from each of the following three systematic groups	9
I. Geog 101, 102, 103, 107	
II. Geog 105, 106, 108, 109, 110, 171	
III. Geog 104, 116, 119T, 120, 177	
Elect from regional courses: Geog 4, 124, 125, 126, 127T, 128T, 129T, 140, 141, 142, 143, 189	15
	36

Additional Requirements: E Ed 105, 107A-B, 120T, 132A-B; one course from E Ed 100, S Ed 184, 186, (24–25 units).

GEOGRAPHY MINOR

	Units
Elect from: (2 courses) Geog 2, 3, or 4; and either Geog 5 or 7	9
Elect from Geography systematic courses (upper division)	6
Elect from upper division Geography	6
	21

CREDENTIAL PROGRAM

For additional information on the credential program, consult departmental advisers and School of Education; see the sections on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in geography is based on undergraduate preparation in geography and/or approved related fields. One year of a foreign language or the equivalent and Geog 115, 135T, and 181 are required for advancement to candidacy for the Thesis Plan, Master of Arts Degree. They are not required for the Nonthesis Plan. For specific requirements consult the departmental graduate adviser; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State College, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies. Assistantships available.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area I:* Geog 5, 7, 106, 108, 109, 146, 171. *Area II:* Geog 2, 3, 4, 101, 102, 103, 116, 120, 177. (See *General Education—Courses*)

COURSES

GEOGRAPHY (Geog)

2. Introduction to Cultural Geography (3)
General background to cultural geography, including origins of cultural landscapes, man's modification of the natural environment, and problems of population and settlement geography.

3. Economic Geography (3)
World distribution of significant commodities, their uses in cultures; agricultural and mineral resource patterns; regionalization of economic activity; implications for contemporary society.

4. World Geography (3)
Cultural and physical features; economic development; resources; man-land relationships. The approach is by continents and/or cultural regions.

5. Physical Geography I: Global Concepts, Weather and Climate (3)
The earth as a planet, map projections, location on the earth's surface, time, oceans, weather and climate.

7. Physical Geography II: The Earth's Surface (3)
A survey of the fundamentals of biogeography and landform analysis.

8. Physical Geography Laboratory (1)
Laboratory study of maps, meteorological measurements, and landform interpretation.

101. Agricultural Geography (3)
Prerequisite: Geog 3 or permission of instructor. Analysis of areal distribution of agricultural (crops and livestock) patterns of the world. Interactions with the environment, role in economics.

102. Transportation Geography (3)
Prerequisite: Geog 3 or permission of instructor. Analysis of areal distribution of transport networks of the world (road, rail, water, and air) and the interaction of these networks with other phenomena.

103. Industrial Geography (3)
Prerequisite: Geog 3 or permission of instructor. Study of form and function; internal, interregional and extraregional connections of the world's industrial regions.

104. Cultural Geography (3)
Prerequisite: Geog 2, 4, or Anth 2, or permission of instructor. Spacial aspects of cultural phenomena in the evolution of early and advanced civilization.

105. Physical Climatology (3)
Interactions of meterological and other physical factors in producing characteristic climates.

106. World Landform Regions (3)
A systematic analysis of types of world landform regions.

107. Geography of Natural Resources (3)
Prerequisite: Geog 3 or permission of instructor. Study of the spatial distributions and relationships of natural resources, including land, water, minerals, plants, and animals; form, inherent characteristics, and external relations with the regions in which they are found; use and misuse.

108. Seminar in Regional Climatology (3)
Undergraduate seminar in regional climatology. Climates as they exist in various parts of the world and their effects upon man and his activities. Students present seminar papers on selected topics.

109. Plant Geography (3)
World floras, plant dispersal, effect of environment on plant form and distribution, vegetation classification, regional analysis, and regional vegetation of western United States.

110. United States Landform Regions (3)
Prerequisite: Geog 106 or Geol 105. Natural regions of the United States based on surface features and their interrelationships.

111. Map Interpretation (3)
Prerequisite: Geol 1, 1L, permission of instructor. Interpretation of foreign and domestic maps; symbols, scale, methods of showing topography, vegetation, culture, land use; soils, water and water levels; characteristics of projections. (2 3-hour labs)

112. Aerial Photograph Interpretation (3)
Prerequisite: Geol 1, permission of instructor. Aerial photographs as a means of determining culture, topography, and vegetation; scale, use of index, vertical and oblique photographs, and stereoscopes. (2 3-hour labs)

113. Advanced Aerial Photo Interpretation and Remote Sensing of Environment (3)
Prerequisite: Geog 112. Interpretation of air-borne and orbital imagery: panchromatic, color, infrared, color infrared, radar, multispectral. (2 3-hour labs)

114. Agricultural Climatology (3) (Same as Plant 170T Section)
Prerequisite: Geog 5 or equivalent, or permission of instructor. Climatic factors influencing agriculture with specific reference to the San Joaquin Valley. Course designed for anyone interested in the relations between climate and agriculture, regardless of major.

115. Cartography (3)
Prerequisite to master's degree program in geography. Emphasis on compiling and drawing a publishable map through the use of drafting instruments, various types of lettering, construction and use of standard map projections, and the proper use of symbols and patterns for thematic maps. (2–3 hour labs)

116. Political Geography (3)
Systematic treatment; nature and structure of states, boundary problems, territorial waters, international power, air space.

119T. Population and Settlement Geography (3; max total 9 if no topic repeated)
Migrations, routes, settlement sites and situations, motives.

120. Urban Geography (3)
The region as a geographic unit; urban settlements as regional centers; city-region relationships; morphology and structure of villages, towns and cities, and their internal functional relationships; case studies.

124. Geography of the USSR (3)
Comprehensive study of the economic, cultural, physical and political geographic foundations of the Soviet state, followed by intensive study of selected regions within the country.

125. Geography of the Middle East (3)
Comprehensive study of the physical features of the Middle East and the cultural traits of its people. The area under consideration extends from the Turkish Straits to the Pamir knot, and from the Caucasus to the Sudan.

126. Australia, New Zealand, and Pacific Islands (3)
Geographic relationship of natural and cultural features to social and economic development.

127T. European Regions (3; max total 9, if no area repeated) (Former Geog 127)
Geographic regions of Europe emphasizing the relation of human activities to physical factors areal in their distribution and influence. Regions to be discussed include Mediterranean lands, Western Europe, Eastern Europe, Central Europe, North Europe, the British Isles.

128T. Asian Regions (3; max total 9, if no area repeated)
Geographic regions of Asia emphasizing physical and cultural features. Regions to be discussed include Southeast Asia, South Asia, and the Far East.

129T. African Regions (3; max total 9 if no region repeated)
Study of major African regions relating to basic physical, cultural, economic, and political geographic conditions and problems. Regions to be discussed include Subsaharan Africa, North Africa, West Africa, East Africa, Central Africa and South Africa.

130. Seminar in Geographic Literature (3)
Prerequisite: geography major or minor. Primary and secondary source materials; literary background of geography. Papers required.

135T. Topics in Quantitative Techniques (3; max total 9 if no topic repeated)
Prerequisite to master's degree program in geography. Application of quantitative techniques to geographic problems; spatial analysis related to economic location, circulation, politico-geographic relationships, landform patterns, climatic data, and vegetation distributions. Topics include basic, advanced, and applied quantitative techniques. (1 unit may be scheduled as a 2-hour lab.)

140. Canada and Alaska (3)
Comprehensive analysis of the physical, economic, and cultural geographic foundations of the northern half of the North American continent.

141. Conterminous United States (3)
Systematic and regional study of the physical, economic, and cultural geographic foundations of the United States excepting Alaska and Hawaii.

142. South America (3)
Relationship of natural and cultural features; economic and social development; man-land relationships. Countries considered individually.

143. Mexico, Central America and West Indies (3)
Relationship of natural and cultural features in Mexico, Central America, and West Indian islands and countries; social and economic development; man-land relationships.

144. Environmental Factors in the Geography of Man (3) (Former Geog 182)
Elements of the physical environment in their effects on man and his activities; physiologic climates, climatic stress, spatial relationships, and the role of soil and water in human activity.

145. Man's Modification of the Natural Environment (3) (Former Geog 182)
Ways in which man's activities have altered climate, landforms, soil and water conditions, and natural vegetation.

146. Environmental Pollution (3) (Former EXP 180, Geog 191.3)
Investigation into those activities of man which are altering the environment in ways which are deleterious to his existence.

147T. Topics in Environment (3; max total 9)
Selected topics relating to man in his environment. May include wilderness problems, recreational geography, urban climatology.

153T. Environmental Regions (3; max total 9, if no area repeated)
Systematic and regional investigation of the physical and cultural complexes of various environmental regions. Regions to be discussed include the Humid Tropics, Arid Lands, Polar Lands, Coastal Lands, Mountain Lands.

171. Soils Geography (3)
Prerequisite: A course in chemistry, Geol 1 desirable. Properties of soil, factors of soil genesis, soil types of the world and their distribution.

177. Seminar in Historical Geography of the United States (3)
Regional settlement of the United States; peopling of physiographic regions, creation of economic (cultural) regions, and geographic factors related to broad trends in American history. One week-end field trip required.

180. Field Geography (1–6; max total 6)
Week-end, semester break, or summer field trips.

181. Technical Field Geography (3)
Prerequisite to master's degree program in geography. Gathering and analysis of rural land use data—crop distribution related to topography, climate, soils, water, markets; urban land use—delineation of central business district (CBD), foot and automobile traffic flows, housing quality, retail and wholesale trade territories, population concentrations and ethnic groupings. (Saturdays 4–8 hours)

189. Geography of California (3)
Natural and cultural patterns of California; historical and regional geography of the state. (Field trips required)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191T. Topics in Geography (1–3; max total 6)
Selected topics in cultural, physical, and economic geography.

192. Directed Readings (1–3)
Supervised readings in a selected field of geography. Combined units of Geog 190 and 192 may not exceed 6 units.

193T. Seminar in Latin American Regions (3; max total 9 if no topic repeated)
Undergraduate seminar in Latin American regions. Comprehensive investigations of physical, cultural and economic aspects of Latin American countries and regions. Students present seminar papers on selected topics, including Brazil, Platine countries, Andean countries, Central America, Mexico, and Carribean Islands.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

203T. Seminar in Economic Geography (3; max total 6 if no topic repeated)
Prerequisite: Geog 3 or 101 or 102 or 103 or permission of instructor. Theory, concepts, and methods in economic geography. Each offering will be chosen from the fields of transportation, industrial, agricultural or resource geography.

260T. Seminar in Physical Geography (3; max total 9)
Prerequisite: graduate standing or permission of instructor. Principles, concepts, and theories in the systematic study of physical geography and its methodology. Each offering chosen from the fields of geomorphology, climatology, biogeography, water, or soils.

230. Seminar in Contemporary Geographic Thought (3)
Prerequisite: graduate standing or permission of instructor. Current theories of geography and their evolution.

260T. Seminar in Human Geography (3; max total 9)
Prerequisite: graduate standing or permission of instructor. Principles, concepts, and theories in the systematic study of a field of human geography and its methodology: political, cultural, urban, historical or population and settlement geography.

270T. Seminar in Selected Regions (3; max total 12 if no region is repeated)
Prerequisite: undergraduate course dealing with the region under study or permission of instructor. Study of geographic conditions in relation to economic, social and political problems in a selected region of the world.

280T Advanced Field Studies in Selected Regions (1–3; max total 6)
Prerequisite: permission of instructor. Intensive field study emphasizing selected cultural, economic, political and/or physical geographical phenomena. The study region may vary with each offering.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

292. Directed Readings in Geography (1–3; max total 6)
Prerequisite: graduate standing. Supervised independent reading in a selected geographical topic.

299. Thesis (2–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

HISTORY DEPARTMENT

Professors: Klassen (Chairman), Baxter, Bilderback, Bohnstedt, Canales, Comegys, Matthew, Nelsen, Wiley

Associate Professors: Benko, S. Chang, Goodwin, Kensel, Nalbandian, R. Smetherman

Assistant Professors: Bjerk, Brouwer, J. Christensen, Contreras, R. Dinkin, Echols, Fireman, Gade, Hudson, D. Jones, Kendall, Ruiz, E. K. Smith

Part-time: C. H. Jen, J. Marquez, Messerlian, R. Scott, W. Taylor

A primary function of the History Department is to give students a liberal education in world and American civilization. It proposes to bring to them an understanding of modern society by reviewing the achievements of the past. Thus the department expects to prepare students to be enlightened citizens equipped with the broad cultural background essential to studies in the fields of education, philosophy, literature, law, government, journalism, public service, and business; all of which today demand a grasp of vital domestic and foreign problems.

The department offers a major and a minor in history for the bachelor of arts degree, a graduate program in history for the master of arts degree, courses for use in teaching credential programs as well as in the nondepartmental Asian Area Studies, the Social Science, and Latin American Studies majors. (See *Special Programs—Asian Area Courses, Classical Studies Courses, Latin American Studies*)

THE AMERICAN HISTORY REQUIREMENT

The American history requirement for graduation may be fulfilled by taking (a) the Advanced Placement Examination (See *General Information—Advanced Placement*), (b) the no-credit departmental examination, (c) Hist 11 or 12, or (d) one of the following upper division courses: Hist 167, 168, 172, 173, 174A or B, 176, 177. No course used to fulfill the American history requirement may be used to satisfy the general education requirements.

ADVANCED PLACEMENT

See *General Information—Advanced Placement.*

HISTORY MAJOR

The following major requirements are in addition to the general education requirements.

	Units
History 101	3
History electives, upper division	27
	30

Courses must be selected from the 3 fields listed below. At least 1 course must be selected in each field, but no more than 18 units in any one field. At least 1 course must deal primarily with history prior to 1700.

Fields

Western Hemisphere: Hist 158, 161, 162, 163A, 163B, 164, 165A, 165B, 166, 167, 168, 169T, 171, 172, 173, 174A, 174B, 175, 176, 177, 178, 179T, 180, 181, 182, 183, 184, 185, 188, 189, 190, 192HD, 193HD.

European: Hist 111, 112, 119T, 120, 121, 122, 131, 132, 137, 138, 139, 141, 142, 143A, 143B, 144A, 144B, 145, 146, 147, 149T, 151, 152, 155, 160A, 160B, 190, 191HD.

Oriental and African: Hist 104A, 104B,104C, 105A, 105B, 106, 107, 108, 109T, 110, 133, 135, 136, 155, 190, 194HD.

Additional Requirements: Hist 1, 2, 3; 3 units from Hist 6, 7, or 8; 6 units approved upper division electives in related fields such as other social sciences and literature.

Foreign Language Requirement

A satisfactory degree of competence in one foreign language is required. Students may meet this requirement by completing two years of satisfactory collegiate study (or equivalent), passing a departmental reading examination, or completing a two-semester reading course in the Department of Foreign Languages. Students who choose not to take

a foreign language may substitute 15 upper division units in courses approved by the Department of History.

See the general statement in section on *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

HISTORY MINOR

The following minor requirements are in addition to the general education requirement in social science.

	Units
Hist 1, 2, 3, 6, 7, 8, 11, 12 (exclude course if used for general education)	6–12
Elect from: Oriental and African	3–6
Elect from: Western Hemisphere	6–9
Elect from: European	6–9
	24

CREDENTIAL PROGRAM

Prospective teachers should complete at least two courses in United States history and two courses in modern European history. Students majoring in history must have their programs approved by departmental credential advisers. For information on the current credential program, consult departmental advisers and the School of Education; see the sections on *Public School Credentials.*

HONORS PROGRAM IN HISTORY

The department offers a special program that permits superior students to graduate with honors in history. These honors will appear on the student's transcript. Admission to the program is limited to students having a GPA of 3.25 or better and who have completed 45 units. These limitations may be waived in exceptional cases.

Graduation with honors in history requires 12 units of upper division honors work in the department as well as at least 3 units of all-college honors work. History honors are designed to be sufficiently flexible to allow students to be directly involved in planning their own programs. The 12 units may be selected from the following categories: Upper division honors seminars (3–9 units); graduate seminar (up to 3 units); independent study (3–6 units).

Six units of lower division honors courses (Hist 1 H D, 2 H D, 11 H D, 12 H D) may be substituted for 3 units of upper division honors seminars. At least 3 units of work in an upper division honors seminar as well as a minimum of 3 units of independent study, are required of all students in the program.

Students who wish to take advantage of this program should consult the departmental honors adviser in order to provide for their special interests and abilities. Application forms for admission to the program are available in the office of the department.

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in history is based on the equivalent of the undergraduate major at Fresno State. For specific requirements, consult the chairman of the department; for general requirements, see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in history requires the passing of an examination demonstrating the ability to read materials of the major in one appropriate foreign language.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area II:* Hist 3, 6, 7, 8, 167, 168, 176, 177. *Area III:* Hist 1, 110, 111, 112, 121, 131, 132. *Area V:* Hist 2, 136, 141, 142, 145, 146, 147, 171, 172, 173, 174A-B, 178, 183. (See *General Education—Courses.*)

COURSES

HISTORY (Hist)

1. Western Civilization to 1650 (3)
Foundations of western civilization; interdependence of cultures and peoples; cultural development from prehistoric times to 1650.

1HD. Western Civilization to 1650 (3)
Honors section of Hist 1. Open only to honors students at the invitation of the instructor.

2. Western Civilization Since 1650 (3)
Political, social and cultural history of Europe since 1650; European expansion and impact of western civilization upon the non-European world; Asian and African nationalist movements in 19th and 20th centuries.

2HD. Western Civilization Since 1650 (3)
Honors section of Hist 2. Open only to honors students at the invitation of the instructor.

3. Colonial America (3)
Western Hemisphere history from discovery to independence.

6. East Asian Civilization I (3)
The cultures and history of China; China's relations with her neighboring Asian and Southeast Asian countries from the earliest times to 1800; examination of the difference between Chinese and American civilizations.

7. East Asian Civilization II (3)
The cultures and history of Japan and Korea from the earliest times to the 1860's and their roles in the traditional East Asian World.

8. Republics of Latin America (3)
Rise of the modern Hispanic American states since 1800; political, social, and economic development.

11. American History to 1865 (3)
Meets the American history requirement. The formation of the Union and the development of American society to 1865.

11HD. American History to 1865 (3)
Honors section of Hist 11. Open only to honors students at the invitation of the instructor.

12. American History from 1865 (3)
Meets the American history requirement. The development of American society since 1865.

12HD. American History from 1865 (3)
Honors section of Hist 12. Open only to honors students at the invitation of the instructor.

101. Introduction to Historical Method (3) (Former Hist 199)
Prerequisite: upper division standing, preferably first-semester junior; permission of instructor. Introductory course for advanced work; bibliography; research techniques, historical writing; appraisal of historians of contemporary significance.

104A. Modern China (3)
Prerequisite: Hist 6 and 7, or permission of instructor. An appraisal of political, social, economic, and cultural developments of China from 1800 to the 1920's.

104B. Recent China (3)
Prerequisite: Hist 6 and 7, or permission of instructor. An appraisal of political, social, economic, and cultural developments of China, communist as well as nationalist, from the 1920's to the present.

104C. Sino-United States Relations (3) (Former Hist 109.5)
Prerequisite: permission of instructor. Appraisal of the diplomatic, cultural, economic, and military relationship between the United States and China from 1800 to the present.

105A. Japan and Korea (3) (Former Hist 105)
Prerequisite: Hist 7 or permission of instructor. Political, economic, and social evolution of Japan and Korea from 1600 to 1912.

105B. Japan and Korea (3) (Former Hist 105)
Prerequisite: Hist 7 or permission of instructor. An analysis of political, economic, and social changes in modern Japan and Korea, from 1912 to the present.

106. India and Pakistan (3)
Prerequisite: Hist 6. Cultural, political, and economic evolution of the subcontinent of India from the formation of the primitive societies to the rise of modern nations.

107. Southeast Asia (3)
Not open to students with credit in Anthro 123. History and cultures of Southeast Asia from earliest times to the present.

108. Ancient Israel (3) (Former Hist 109T.1)
History of the Jewish people from earliest times to the fall of Jerusalem in 70 A.D.

109T. Studies in Oriental and African History (3; max total 6 if no area repeated)
Prerequisite: permission of instructor. Intensive study of special topics.

110. Ancient Fertile Crescent (3)
Ancient civilization of the Middle East from the dawn of history to the ascendance of Greece.

111. Ancient Greece (3) (Former Hist 111A)
The Hellenic and Hellenistic periods of Greek history to the dissolution of Alexander's empire.

112. Ancient Rome (3) (Former Hist 111B)
Evolution of Rome through the republican and imperial periods.

118. Women in History (3) (Same as W S 118)
Historical survey of women's roles in history, with an emphasis on the emergence of the feminist movement.

119T. Studies in Ancient and Medieval History (3; max total 6 if no area repeated)
Prerequisite: permission of instructor. Intensive study of special topics.

120. Byzantine History (3)
Prerequisite: Hist 1 or equivalent. Eastern Roman Empire from Justinian to the fall of Constantinople; the role and development of the Church, internal development, and its relations with the Islamic, Latin, and Slavic worlds.

121. Formation of the Medieval Order (3)
Prerequisite: Hist 1. Influences of Neoplatonism, Universalism, and Christianity in the development of thought and institutions; Monasticism, Feudalism, Crusading, and the Papacy.

122. Disintegration of the Medieval Order (3)
Prerequisite: Hist 1. Conflict between Christian Universalism and National Particularism. Examination of the Hundred Years War, Babylonian Captivity of the Church, Conciliarism, and tradition of ecclesiastical dissent prior to the Reformation.

129T. Studies in Intellectual and Social History (3; max total 6 if no area repeated)
Topics concerned with ideas and movements that have significantly shaped the course of history.

131. Renaissance (3)
Prerequisite: Hist 1 or equivalent or permission of instructor. The foundations of modern Europe during the 14th and 15th centuries.

132. Reformation (3)
Prerequisite: Hist 1 or equivalent or permission of instructor. Analysis of the political, social, and intellectual movements associated with the 16th century religious upheaval.

133. Armenian History (3) (Same as Arm S 133)
Prerequisite: Hist 1 or permission of instructor. Economic, political, social, religious, and cultural history of Armenia from earliest times to the present.

135. Moslem World (3)
Political and cultural development of the Arabs, Turks, Berbers, and other Moslem peoples from Mohammed to the present.

136. Africa (3)
Prerequisite: permission of instructor. The chronological development and the indigenous and foreign influences which have created modern Africa.

137. Russia 862–1800 (3)
Prerequisite: Hist 1, or permission of instructor. The development of Russian national life from the origins of Kievan Russia through the reign of Catherine the Great.

138. Russia 1800–1917 (3)
Prerequisite: Hist 2, or permission of instructor. The modification of Russian political and social institutions in the nineteenth century and the development of the Russian revolutionary tradition.

139. Soviet Union (3)
Prerequisite: Hist 2 or permission of instructor. The impact of Marxist ideology and the influence of prerevolutionary norms in Soviet government and society, 1917 to the present.

141. Europe 1618–1715 (3)
Prerequisite: Hist 2 or equivalent. European culture, institutions, and politics from the start of the Thirty Years' War to the death of Louis XIV.

142. Europe 1715–1815 (3)
Prerequisite: Hist 2 or equivalent. European culture, institutions, and politics from the death of Louis XIV to the end of the Napoleonic era.

143A–B. Modern Germany (3–3)
Not open to students with credit in Hist 143 prior to September 1969. Prerequisite: Hist 2 or equivalent. (A) Political, social, cultural development of Germany from Frederick the Great to the outbreak of World War I. (B) Political, economic, and ideological analysis of German history from 1914 to the present; contemporary German society.

144A–B. Modern France (3–3)
Not open to students with credit in Hist 144 prior to September, 1970. Prerequisite: Hist 1 or 2 or permission of instructor. (A) Culture, politics, and society of France from Francis I to Napoleon. (B) Political, social, and economic history of France in the nineteenth and twentieth centuries.

145. Europe 1815–1870 (3)
Not open to students with credit in Hist 146 prior to fall 1970. Prerequisite: Hist 2 or equivalent. Political, social, and cultural development of Europe from the Congress of Vienna to the Franco-Prussian War.

146. Europe 1871–1914 (3)
Prerequisite: Hist 2 or equivalent. Political, social, and cultural development of Europe from the Franco-Prussian War to the outbreak of World War I.

1675 1 3 4 45

147. Europe Since 1914 (3)
Prerequisite: Hist 2 or equivalent. The European nations in two world wars; rise and character of totalitarian movements; social and economic developments; artistic achievements, new intellectual currents; revolt of Asia and Africa against European dominance.

149T. Studies in Modern European History (3; max total 6 if no area repeated)
Prerequisite: permission of instructor. Intensive study of special topics.

151. England to 1688 (3)
Structure of the British government, society, and economic life from Roman times to the Glorious Revolution.

152. England Since 1688 (3)
Changing structure of the British government, economy, and society from the Glorious Revolution to the present.

155. British Empire Since 1783 (3)
Political and economic development of the British Empire, including the development of the Commonwealth, colonial nationalism, and changes in British colonial policy.

158. Canada (3)
Discovery, growth and expansion of Canada, social, economic and political institutions from the French regime through British rule to the Transcontinental Dominion.

160A–B. Spain and Portugal (3–3)
Prerequisite: Hist 2 or permission of instructor. (A) Development of the Iberian Peninsula from prehistoric times to the Napoleonic Invasion of 1808. (B) From 1808 to present; political, social and economic institutions; outstanding literary works.

161. Colonial Latin America (3)
The age of discovery, European and American background; political, social and economic institutions of the Spanish and Portuguese empires in America.

162. Platine Countries (3) (Former Hist 162A)
Prerequisite: Hist 8 or equivalent. Disintegration of the Viceroyalty of La Plata and the formation of Argentina, Paraguay, and Uruguay from 1800 to the present.

163A. Caribbean America (3) (Former Hist 162B)
Prerequisite: Hist 3 or equivalent. Origins and evolution of the nations of Central America and the Greater Antilles; their struggle for self-determination and sovereignty from 1800 to the present.

163B. Caribbean America (3) (Former Hist 162C)
Prerequisite: Hist 8 or equivalent. Creation and growth of the nations of Venezuela and Colombia, 1900 to the present.

164. Western South America (3) (Former Hist 162C)
Prerequisite: Hist 8 or equivalent. Development of the countries which once formed the bulk of the Viceroyalty of Peru: Ecuador, Peru, Bolivia, and Chile, 1800 to the present.

165A. Nineteenth Century Mexico (3)
Not open to students with credit in Hist 165. Prerequisite: Hist 3 or equivalent. Development of Mexican nationality and culture from 1800–1910.

165B. Twentieth Century Mexico (3)
Not open to students with credit in Hist 165. Prerequisite: Hist 8 or equivalent. Forging of modern Mexican nationality and culture through the political, social, and economic changes created by the Mexican Revolution.

166. Brazil (3)
Prerequisite: Hist 3 or permission of instructor. Brazil from 1800 to the present; emphasis on major political, economic, and social developments.

167. American Diplomatic History to 1898 (3)
Principles, ideals, and policies of the United States in diplomatic relations from 1775 to 1898.

168. American Diplomatic History Since 1898 (3)
Not open to students with credit in Hist 167 prior to September 1970. Principles, ideals, and policies of the United States from 1898 to the present.

169T. Studies in Latin American History (3; max total 6 if no area repeated) (Approved section same as La R 169T)
Prerequisite: permission of instructor. Intensive study of special topics.

171. Early American History, 1607–1783 (3)
Meets the American history requirement. First of a sequence of four courses covering the full period of history of the United States; colonial foundations; political and economic factors; social and cultural development through the American Revolution.

172. United States History, 1783–1850 (3)
Meets the American history requirement. Political, economic, social, and cultural developments of the early agrarian republic.

173. United States History, 1850–1914 (3)
Meets the American history requirement. The Civil War and Reconstruction; problems of an increasingly urban and industrialized society.

174A. United State History 1914–1945 (3) (Former Hist 174)
Meets the American history requirement. The United States in world affairs; political, economic, social, and cultural developments and problems from 1914 to 1945.

174B. United States History, 1945–Present (3) (Former Hist 174)
Meets the American history requirement. The United States in world affairs; political, economic, social, and cultural developments, and problems from 1945 to present.

175. Representative Americans (3)
Biographical sketches of leading characters in American history from Revolution to present. Lectures and reading from standard biographies.

176. Social and Intellectual History of the United States to 1865 (3)
Development of the American people; leading ideas and values in a predominantly rural and agrarian society.

177. Social and Intellectual History of the United States Since 1865 (3)
Impact of industrialization and urbanization upon American society; leading ideas and values.

178. History of Black Americans (3) (Same as Bl S 178)
Evolution of American Black society from 1619 to the present; developments in the twentieth century.

179T. Studies in United States History (3; max total 6 if no area repeated)
Prerequisite: permission of instructor. Intensive study of special topics.

180. United States Military History (3) (Former Hist 179T.2)
History of America's wars encompassing both military aspects and the social impact of war, beginning with the American War for Independence.

181. Westward Movement to 1848 (3)
The challenge of free land; development of British and United States western policies; problems of American migration to the interior, effects of the frontier environment upon the culture of the West.

182. Westward Movement Since 1848 (3)
Patterns of exploitation; role of the federal government in the West: land policy, Indian policy; problems of communication; economic growth.

183. The Hispanic Southwest (3) (Same as La R 183)
Exploration, conquest, and settlement of the Spanish Borderlands from 1513 to the Mexican War; contributions of Hispanic culture to the Southwest.

184. Politics of Affluence and Poverty (3) (Former Hist 179T.5)
Major elements in America's triumphs and failures with emphasis on political and social influence since 1865.

185. San Joaquin Valley (2)
San Joaquin Valley from Indian days to present; recent expansion in agriculture and industry.

188. Early California (3) (Former Hist 189A)
Prerequisite: Hist 3 or equivalent; upper division standing. Discovery, exploration, and early settlement of Alta California; founding of the missions; the Spanish, Mexican, and American periods; government, customs, habits, and influences of the various peoples who occupied California.

189. Modern California (3) (Former Hist 189B)
Social, cultural, economic, and political development of California from the 1860's to the present.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191HD. European History Honors Seminar (3; max total 6 if no area repeated)
Undergraduate honors seminar in selected topics in European history.

192HD. North American History Honors Seminar (3; max total 6 if no area repeated)
Undergraduate honors seminar in selected topics in North American history.

193HD. Latin American History Honors Seminar (3; max total 6 if no area repeated)
Undergraduate honors seminar in selected topics in Latin American history.

194HD. Oriental and African History Honors Seminar (3; max total 6 if no area repeated)
Undergraduate honors seminar in selected topics in Oriental and African history.

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligibility*)

200. Seminar in Historiography (3) (Former History 202)
Prerequisite: major or minor in one of the social sciences. Advanced studies in a field of history; American, Latin-American, European; writings and philosophies of great historians; development of historiography.

201. Reading Seminar (3)
Open only to second-semester seniors and graduates majoring in history. Prerequisite: see instructor. Extensive, individually directed readings in history.

205T. Seminar in Far Eastern History (3; max total 6)
Prerequisite: Hist 101 or permission of instructor. Research in specific areas of Far Eastern history and culture.

210T. Seminar in Ancient History (3; max total 6)
Prerequisite: Hist 101 and related undergraduate course (Hist 110, 111, or 112). Research in special problems in the Ancient Fertile Crescent, Ancient Greece, Ancient Rome.

220. Seminar in Medieval History (3; max total 6)
Prerequisite: Hist 101, 120, 121, 122. Research on special problems in medieval history.

230. Seminar in Renaissance and Reformation (3; max total 6)
Prerequisite: Hist 101, 131, 132. Research in special problems of the Renaissance and Reformation Period.

233. Seminar in the Middle East (3)
Prerequisite: Hist 101, 133, 135. Research in specific areas of Middle Eastern history and culture.

236. Seminar in Africa (3)
Prerequisite: Hist 101, 136. Research in specific areas of African history.

240T. Seminar in Modern Europe (3; max total 6)
Prerequisite: see instructor. Selected research topics in modern European history.

250. Seminar in Canada (3; max total 6)
Prerequisite: Hist 101, 158. Selected research topics in Canadian history.

260T. Seminar in Latin America (3; max total 6) (Former Hist 263)
Prerequisite: see instructor. Selected research topics in Latin American history.

270T. Seminar in United States (3; max total 6)
Prerequisite: see instructor.

278. Recent Interpretations of American History (3; max total 6)
Prerequisite: see instructor. Examination of selected problems in American history in the light of new research discoveries; extensive use of scholarly journals.

289. Seminar in California History (3; max total 6)
Prerequisite: Hist 101, 188, 189. Research on special problems in California history.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299 A-B. Thesis (3-3)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree. A. Thesis design. B. Thesis writing. A and B may be taken concurrently.

IN-SERVICE COURSES

(See *Course Numbering System*)

300. Topics in History (2; max total 8 if no topic repeated)

POLITICAL SCIENCE DEPARTMENT

Professors: Haak, Provost, Svenson, Tueller

Associate Professors: Rotstan (Chairman), Beach, Dargahi, Denton, Franc, Kolstad, McGoldrick, H. Moore, F. Wright

Assistant Professors: Broyles, Cha, Heine

Lecturers: A. Evans, Groff

Part-time: Goodwin, Hubbart, B. Smetherman

The Political Science Department offers courses leading to a bachelor of arts degree with a major or minor in political science or public administration, a certificate in public administration, and the master of arts degree. In addition to curricula designed to prepare students for careers in teaching, government or related fields, the department offers courses for the nonmajor to meet general education requirements and to provide insight into the field of politics for the student concerned with his role as a citizen in a democracy.

The department cooperates with other departments in providing a concentration in Asian Studies and Latin American Studies. (See *Special Programs—Asian Area Courses, Latin American Studies*)

FOREIGN LANGUAGE AND STATISTICS REQUIREMENT

The department requires that students majoring in either political science or public administration have (1) one year of competency in a modern foreign language or (2) six units of statistics and/or data processing. A student with a foreign language background may determine competency by taking the Foreign Language Department qualifying examination. Regardless of the option selected students are required to complete a course in elementary statistics. The foreign language requirement is waived for foreign students whose native language is not English. All foreign students having deficiencies in English are urged to seek aid in overcoming the deficiencies.

UNITED STATES CONSTITUTION REQUIREMENT

The United States Constitution (including California state constitution and local government) requirement for graduation should be fulfilled by Pl Si 2 or 101. Pl Si 1 and 3 do not fulfill the United States Constitution requirement.

BACHELOR OF ARTS DEGREE IN POLITICAL SCIENCE

	Units
General Education	40
Political Science Major	30
Pl Si 3, 110 or 111, 120, 140, 150	
Political Science electives (upper division), excluding Pl Si 101, 102, 130, 187	
Additional Requirements	12
Electives (upper division), approved by the adviser, in at least three of the following disciplines: Economics, English, Ethnic Studies, Geography, History, Philosophy, Psychology, Anthropology, or Sociology.	
Electives	42
See Foreign Language and Statistics Requirement.	
	124

BACHELOR OF ARTS DEGREE IN PUBLIC ADMINISTRATION

	Units
General Education	40
Public Administration Major	33
Pl Si 3, 181, 182 (9 units)	
Elect from: Pl Si 110, 111, 114, 170 (3 units)	
Pl Si 150, 151, 156T, 158T, 159T (3 units)	
Pl Si 160, 163, 169T (3 units)	
Pl Si 183, 188T, 189T (9 units)	
Pl Si 187, 190, 191 (6 units)	
Additional Requirements	9
Electives (upper division) approved by the adviser, in at least three of the following disciplines: Economics, English, Ethnic Studies, Geography, History, Philosophy, Psychology, Anthropology, or Sociology.	
Electives	42
	124

See Foreign Language and Statistics Requirements

MINORS

The following minor requirements are in addition to the general education requirement in social science.

Political Science	*Units*
Pl Si 3, 110 or 111	6
Political science electives (ud), excluding Pl Si 101, 102, 130, 187	9
Electives (ud) in Anthropology, Economics, English, Geography, History, Philosophy, Psychology, or Sociology	6
	21

Public Administration	
Elect from Pl Si 3, 181, 182, 188T	12–13
Elect from Pl Si 110, 111, 114, 150, 151, 170	3–4
Elect from Pl Si 160, 163, 183, 189	3
Electives (upper division) in Anthropology, Economics, English, Geography, History, Philosophy, Psychology or Sociology	3
	21–23

CERTIFICATE IN PUBLIC ADMINISTRATION

A certificate program in public administration is offered for persons interested in training for public service who are not in a position to meet the requirements for a degree. This certificate will be offered to public service personnel and others without reference to previous academic experience. Candidacy will be established with the approval of the Political Science Department. The candidate must complete a minimum of 23 units with a grade point average of 2.5 (20 units, if the candidate has completed an acceptable course in American government on the college or university level).

All candidates for the certificate must complete a core requirement of 12–15 units of political science and public administration in Group A and 8 units in Group B. With the approval of the Political Science Department substitutions may be made for courses already completed. Prerequisite requirements to advanced courses must be met.

Group A. Political Science and Public Administration: Pl Si 101, 160, 163, 181, 182.

Group B. Related Courses: Psych 10, 181, Pl Si 188T, Econ 131, Ind R 150, Jour 113.

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the School of Education; see the section on *Public School Credentials.*

MASTER OF ARTS DEGREE

The graduate program for the master of arts degree in political science provides concentrations in government and public administration. For prerequisites and specific requirements consult the department chairman; for general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State, see the *Graduate Bulletin,* available in the Office of the School of Graduate Studies.

FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of arts degree with a major in political science (government concentration) requires competence in a foreign language.

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area II:* Pl Si 1, 10T, 120, 121, 122, 151. (See *General Education—Courses*)

COURSES

POLITICAL SCIENCE (Pl Si)

1. Elements of Political Systems (3)
General Education Area II; not open to students with credit in Pl Si 3. Introduction to the major disciplinary areas of political theory, comparative systems, political parties, public opinion and interest groups, public administration, and international relations through focus on ideologies and the structures, functions, and processes of governmental and political institutions.

2. American Government and Institutions (3) (Former Pol Sc 11)
Meets the United States Constitution requirement and the federal, California state and local government requirement. Not open to students with credit in Pl Si 1A-B or 101. The development and operation of government in the United States; study of how ideas, institutions, laws, and people have constructed and maintained a political order in America.

3. Political Analysis (3)
For Political Science and Public Administration majors; not open to students with credit in Pl Si 1. Classical and contemporary political analysis of the structures, functions, and processes of macro- and micro-political systems; fields of political science; research techniques.

10T. Contemporary Issues in Politics (3; max total 9 if no topic repeated)
Prerequisite: Pl Si 2, 3, or permission of instructor. Significant contemporary uses in political theory, world politics, comparative government, American government, local government, or public administration.

101. American Constitution, Institutions and Ideals (3)
Meets the United States Constitution requirement. Not open to students below second semester sophomore or with credit in Pl Si 1A-B, 2, 11, or equivalent. Executive, legislative, and judicial functions of our government under the constitution; federal, California state and local governmental relationships.

102. California Government and Institutions (1)
Not open to students with credit in Pl Si 1A-B, 2, 11, 101, or equivalent. Open only to students who have satisfied United States Constitution requirement but have not satisfied California state and local government requirement. Examination of legislative, executive, judicial, and local government problems in California.

POLITICAL THEORY (Pl Si)

110. Seminar in History of Political Thought to Machiavelli (3)
Prerequisite: Pl Si 2, 3, or permission of instructor. Development of political thought from Plato to Machiavelli: law, justice, the state, authority, forms of government, and church-state relations in light of the philosophy of history.

111. Seminar in History of Political Thought Since Machiavelli (3)
Prerequisite: Pl Si 2, 3, or permission of instructor. Freedom and individual rights, democracy, majority rule, equality, law and authority, power, constitutionalism, property, social class and structure, and revolution traced through the writings of Hobbs, Locke, Rosseau, Hume, Burke, Bentham, Hegal, Tocqueville, Mill, and Dewey.

114. Seminar in American Political Thought (3)
Prerequisite: Pl Si 2, 3, or permission of instructor. Analysis of democracy, majority rule and minority rights, constitutionalism, federalism, representation, pluralism, property, separation of powers, and judicial review based on the perspectives of representative early and contemporary American thinkers.

115. Seminar in Modern Political Analysis (3)
Prerequisite: Pl Si 2, 3 or permission of instructor. Theoretical approach to contemporary methods of analysis; systems, functions, processes, culture, decision making, conflict theory, power, elitism, model building and cybernetics. Relation of theories of knowledge to the above methods and their applicability to a science of political development.

118T. Topics in Political Thought (1–4; max total 8)
Prerequisite: Pl Si 3 or permission of instructor. Possible topics include democratic political thought, Soviet political thought, pluralism, socialism, classical liberalism, and conservatism.

119T. Topics in Political Theory (1–4; max total 8)
Prerequisite: Pl Si 3 or permission of instructor. Analysis of Marxism (Hegel, pre-Marxian socialists, emphasis on text of Marx), or radical political theology (christian religious consciousness as permanent revolution), or Medieval political thought (church-state theory as legal and political philosophy, emphasis on Augustine, Acquinas).

INTERNATIONAL RELATIONS (Pl Si)

120. International Relations (3) (Former Pol Sc 127)
Prerequisite: Pl Si 3 or permission of instructor. Analytical introduction to international relations; nationalism; imperialism; racial, population, and economic factors; war; settlement of international disputes by methods other than war; foreign policies of the major powers.

121. American Foreign Affairs (3) (Former Pol Sc 132)
Prerequisite: Pl Si 3 or permission of instructor. Formulation and execution of American foreign policy; constitutional framework; role of the President and the executive branch, Congress, pressure groups and public opinion; contemporary problems and policies.

122. Contemporary World Politics (3) (Former Pol Sc 128)
Prerequisite: Pl Si 3 or permission of instructor. World affairs from 1914 to the present; present foreign policies of the major powers from historical, political, and economic viewpoints; events leading to World War II and United Nations organizations.

125. Soviet Foreign Policy (3) (Former Pol Sc 136)
Prerequisite: Pl Si 3 or permission of instructor. Sources of Soviet foreign policy, historical and ideological; continuity and change in methods, strategy and tactics; policy formulation and application in specific geographic and subject matter areas.

126. International Organizations (3)
Prerequisite: Pl Si 120 or permission of instructor. Developing role of international organizations; historical roots of organized cooperation; League of Nations, United Nations, regional pacts; political and organizational issues confronting the United Nations.

128T. Topics in International Relations (1–4; max total 8 if no topic repeated) (Former Pol Sc 139T)
Prerequisite: Pl Si 3 or permission of instructor. Nationalism, imperialism, communism, balance of power concepts, the superpowers (United States and USSR).

129T. Seminar in International Politics (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 3 or permission of instructor. Neutralism and nonalignment, regionalism, foreign policies of underdeveloped countries and of communist states (excluding USSR).

130. Contemporary International Problems (3; max total 6) (Former Pol Sc 129)
Prerequisite: Pl Si 2, 3 or permission of instructor. Projects involve current international problems; e.g., organization and participation in Model United Nations conference on-campus or at other colleges. Research on multilateral *vs* bilateral international problem solving.

COMPARATIVE GOVERNMENT (Pl Si)

140. Approaches to Comparative Politics (3)
Prerequisite: Pl Si 3 or permission of instructor. Exploration of theories, models, and conceptual frameworks for the comparative study of political systems and subsystems; methodological rather than areal emphasis.

141T. Area Studies in the Commonwealth (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 3 or permission of instructor. Government and politics of England and the Commonwealth Countries or government, politics, and institutions of selected countries.

142T. Area Studies in Western Europe (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Government and politics of Western Europe (France, Germany, Italy), Northern European Countries (Finland, Denmark, Norway, Sweden); or government, politics, and institutions of selected countries.

143T. Area Studies in Eastern Europe (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Government and politics of Soviet Union, Eastern Europe; or government, politics, and institutions of selected countries.

144T. Area Studies in Africa and Middle East (1–4; max total 8 if no topic is repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Government and politics of Sub-Sahara Africa, Middle East; or government, politics, and institutions of selected countries.

145T. Area Studies in Asia (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Government and politics of East Asia; or government, politics, and institutions of selected countries.

146T. Area Studies in Latin America (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Possible topics include politics of South America; politics of Central America and Caribbean countries; roles of selected groups in Latin American politics.

148T. Topics in Comparative Government (1–4; max total 8)
Prerequisite: Pl Si 2, 3, or permission of instructor. Topics studied in the context of more than one region; may include political violence, socialization, development, participation, and specific political groups.

149T. Seminar in Comparative Government (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Parliamentary systems, problems and goals of developing nations, federal systems, comparative local government, parties and pressure groups, and multi-party systems.

AMERICAN GOVERNMENT (Pl Si)

150. Politics: Public Policy Making (4) (Former Pol Sc 156)
Prerequisite: Pl Si 2, 3 or permission of instructor. The relationship of persons, groups, and institutions to the making and implementing of public policy in the United States; consideration of the participants and the modes of analysis and thought influencing public policy.

151. Politics: Electorate and Political Parties (4) (Former Pol Sc 152)
Prerequisite: Pl Si 2 or permission of instructor. Political parties; nature and extent of citizen political activity; election of public officials; political organization of government.

156T. Topics in Political Behavior (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Voting behavior, political alienation, leadership, political perceptions and knowledge, environmental effects on political participation, group processes, and political socialization.

158T. Topics in Political Institutions (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Executive, legislative, judicial, independent regulatory agencies; interstate compacts; specific departments or agencies; relationships.

159T. Seminar in American Government and Politics (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Congressional committee operations, policy making by the courts, political implications of civil service, executive initiation of legislation, minority groups and politics, political implications of news reporting; jurisprudence and legal philosophy; legal institutions.

LOCAL GOVERNMENT (Pl Si)

160. State and County Government (3) (Former Pol Sc 161)
Prerequisite: Pl Si 2 or permission of instructor. The organization, structure, powers, and functions of state and county governments.

163. Municipal Government (3)
Prerequisite: Pl Si 2 or permission of instructor. Organization, powers, and functions of city government; types of city charters, relationship between city and state government; police and fire protection, education, water supply, health and sanitation, city planning, debts and taxation, public utilities.

168T. Topics in Local Government (1–4; max total 8)
Prerequisite: Pl Si 2, 3, or permission of instructor. Possible topics include political control, housing, planning, redevelopment, revenue sources, transportation, quality of life (crime, cultural centers, parks, recreation), waste pollution, city-suburban conflict, population shift, or intergovernmental relations.

169T. Seminar in Metropolitan Government and Politics (1–4; max total 8 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Regional and area intergovernmental relations, urban renewal, human relations agencies, and taxation methodologies.

PUBLIC LAW (Pl Si)

170. United States Constitution: Growth and Development in Theory and Practice (3) (Former Pol Sc 157)
Prerequisite: Pl Si 2, 3 or permission of instructor. Law of the Constitution and its underlying political theory, with leading cases.

178T. Topics in Public Law (1–4; max total 8)
Prerequisite: Pl Si 2 or 3. Law and politics, judicial process and behavior, discrimination and civil rights, First Amendment freedoms, environmental law.

179T. Seminar in Public Law (1–4; max total 8)
Prerequisite: Pl Si 2 or 3. Administrative law, international law, judicial administration, jurisprudence, legal institutuions.

PUBLIC ADMINISTRATION (Pl Si)

181. Public Administration (3) (Former Pol Sc 164A)
Prerequisite: Pl Si 2 or permission of instructor. General analysis of the field of public administration; administrative theories; policy and administration; behavioralism; budgeting, planning, and legal framework.

182. Administrative Analysis: Management and Organization (3) (Former Pol Sc 164B)
Prerequisite: Pl Si 181 or permission of instructor. Administrative organization; methods and procedures; problem solving; reports and records; resource management.

183. Comparative Administration (3) (Former Pol Sc 167)
Prerequisite: Pl Si 2, 3 or permission of instructor. Theories of comparative public administration; cross-national comparisons of administrative processes; institutions, policy formation, and behavior with consideration of cultural, social, and economic environments.

187. Internship in Public Administration (2–6; max total 6) (Former Pol Sc 180)
Maximum credit toward public administration major, 3 units. Prerequisite: Pl Si 2, 3 and permission of instructor. Supervised experience in government-in-action; work assignments in public agencies; written projects. (1 weekly seminar; minimum of 4 field hours per unit)

188T. Topics in Public Administration (1–4; max total 9 if no topic repeated)
Prerequisite: Pl Si 2, 3 or permission of instructor. Treatment of current topics and problems in fiscal administration, personnel management, and planning.

189T. Seminar in Public Administration (3; max total 6 if no topic repeated) (Former Pol Sc 174T)
Prerequisite: Pl Si 2, 3 or permission of instructor. The values and philosophy of administration; management and dynamics of change; public relations and communication problems in public administration; planning problems and techniques; systems approach to resource management.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

191. Directed Readings (1)
Directed readings and supplemental and original source material for enrichment of regular offerings in the subdiscipline.

199. Scope and Method in Political Science (3)
Prerequisite: junior standing. Approaches to the study of political science with emphasis on analysis, methodology, and bibliographic technique.

GRADUATE COURSES (Pl Si)

(See *Course Numbering System—Definitions and Eligibility*)

200. Seminar: Introduction to Graduate Studies (3)
Prerequisite: Pl Si 199 or permission of instructor. Concepts and problems in political philosophy and political science; major theoretical systems or analysis of comparative politics, political systems, and developmental change; cross-cultural problems.

210. Seminar in Political Theory (3; max total 6 if topics not repeated) (Former Pol Sc 212)
Prerequisite: permission of instructor. Advanced research and analysis of problems of sovereignty; relationships between the individual and the state; limitations of governmental authority; effect of crisis and challenge in international relations.

220. Seminar in International Relations (3; max total 6)
Prerequisite: Pl Si 120, permission of instructor. Research and analysis in an area of international politics: theory, law, organization, conflict resolution, foreign policy formulation.

249. Seminar in Comparative Government (3; max total 6)
Prerequisite: Pl Si 120, 140, and permission of instructor. Advanced level synthesis of basic concepts, issues, and problems of comparative government.

250. Seminar in American Government (3; max total 6) (Former Pol Sc 240)
Prerequisite: Pl Si 2, permission of instructor. Research and analysis of issues, concepts, and problems in the field of American Government; federalism, political parties, pressure groups, electoral behavior, legislative process, constitutional law.

270. Seminar in Public Law (3; max total 6 if topic not repeated) (Former Pol Sc 269)
Prerequisite: Pl Si 114, 170, and permission of instructor. Role and function of the judiciary and judicial systems in the formulation of governmental policy; problems in constitutional law, administrative law, international law, judicial process, and judicial administration.

280. Seminar in Public Administration (3; max total 6 if topic not repeated) (Former Pol Sc 264)
Prerequisite: permission of instructor. Problems in administrative analysis and organization, tools and techniques of administrative research, interpretation and application of research findings.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

299. Thesis (3–6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

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SOCIAL SCIENCE MAJOR

A major in social science is offered for the bachelor of arts degree. This major meets the requirements for a diversified/interdepartmental major for a standard teaching credential. Since there is no social science department, students following this program will be assigned to a faculty adviser in the department in which they are taking the 15 upper division units and are urged to consult him for assistance in planning their programs.

The major in social science consists of 36 units, of which at least 24 are upper division.

	Units
Upper division requirements:	24
From one of the following disciplines: Anthropology, Economics, Geography, History, Political Science, Sociology (15 units)	
From other disciplines (one or more of those listed above) (9 units)	
Other requirements:	12
From the disciplines listed below (upper or lower division)	
	36

Students must plan their total program so that at least six units are taken in six of the following disciplines: Anthropology, Black Studies, Economics, Ethnic Studies, Geography, History, La Raza Studies, Political Science, and Sociology. All units in excess of 36 may, where applicable, be credited toward the general education or other graduation requirements.

CREDENTIAL PROGRAM

For information on the current credential program, consult departmental advisers and the *School of Education;* see the section on *Public School Credentials.*

SOCIOLOGY DEPARTMENT

Professors: Dackawich (Chairman), Beatty, Dienstein, Washburne

Assistant Professors: J. Best, Claassen, Gregg, Marlowe, McLeod, J. Tinker, Weber, York

The department offers a major for the bachelor of arts degree and a minor for students majoring in other departments. The major is designed to provide a broad liberal arts background, as well as an adequate basis for graduate education. Cooperation is given to other departments in providing for students with such majors as social science and child-development.

MAJOR

The following degree major requirements are in addition to general education requirements.

Sociology	*Units*
Soc 1, 25, 152, 153, 175	15
Sociology electives (ud)	24
	39

MINOR

The following minor requirements are in addition to general education requirements.

Sociology	
Soc 1, 25	6
Electives in sociology (ud)	15
	21

CREDENTIAL PROGRAM

For information on the current credential program consult the departmental advisers and the School of Education; see the section on *Public School Credentials.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area II:* Soc 1, 2, 25, 111, 112, 130, 143, 145, 151, 152, 157, 159, 162, 163, 165. (See *General Education—Courses*)

COURSES

SOCIOLOGY (Soc)

1. Principles of Sociology (3)
Basic principles and concepts of sociology; scientific study of society, important group types, and primary social processes; norms, roles, interaction, social systems, socialization, stratification, and social control.

2. Social Problems (3)
Analysis of those prevalent conditions in American society considered undesirable and remediable.

25. Elementary Statistics (3)
Required of students majoring in sociology. Prerequisite: Soc 1 or permission of instructor. Techniques for describing and analyzing quantitative data specifically related to sociology. Tabular and graphic presentation; commonly used measure of association; samples and sampling error; commonly used statistical tests. (2 lecture, 1 lab hour)

111. Sociology of Minority Relations (3)
Prerequisite: Soc 1 or Anth 2, permission of instructor. Social processes involved in minority relations in the United States in terms of race, class, caste, ethnicity, politics, and religion; sources of minority attitudes; patterns of minority adjustment; trends in minority relations.

112. Collective Behavior (3)
Prerequisite: Soc 1 or permission of instructor. Theoretical and systematic treatment of episodes of collective behavior: panic, craze, hostile outburst, norm-oriented movements, and value-oriented movements. Collective behavior as a type of social phenomenon and an aspect of modern society.

125. Seminar in Experimental Sociology (3)
Prerequisite: Soc 1 or permission of instructor; Soc 25 recommended. Selected sociological experiments related to social principles and processes.

130. Contemporary Social Issues (3)
Study in depth of current social issues on which the attention of the society is focused.

131. Sociology of Sex Roles (3) (Same as W S 131)
Prerequisite: Soc 1 or permission of instructor. The significance of differences in roles assigned to women and men for the social system; their effects upon socialization and social interaction; their relationship to major social institutions.

143. Deviation and Control (3)
Prerequisite: Soc 1 or permission of instructor. Deviance as a social phenomenon; positive and negative consequences; theories of deviance; formal and informal social control of deviance.

145. Social Organization (3)
Prerequisite: Soc 1 or permission of instructor. Factors related to social organization: complex organization, bureaucracy, formal and informal processes, authority systems; open-systems theory.

146. Sociology of Work (3)
Prerequisite: Soc 1 or permission of instructor. Formal and informal character of work relations and their significance in the context of the larger community.

147. Medical Sociology (3)
Prerequisite: Soc 1 or permission of instructor. Social relations and culture as factors affecting health; illness, prevention and treatment.

148. Sociology of Education (3)
Prerequisite: Soc 1 or permission of instructor. A sociological examination of education as an institution, including its social determinants, functions, and consequences.

149. Sociology of Law and Society (3)
Prerequisite: Soc 1 or permission of instructor. Functions of law in society; social sources of legal change; social conditions affecting the administration of justice; role of sociology in jurisprudence.

150T. Special Topics Seminar (1–3; max total 9)
Prerequisite: permission of instructor. Topics include those areas of advanced theoretical and empirical studies that will orient the student to contemporary sociological endeavors.

151. Social Stratification (3)
Prerequisite: Soc 1 or permission of instructor. Analysis of evaluational differentiation leading to social stratification. Criteria for differentiation, bases for evaluation, types of stratification, composition of strata and status systems, mobility, consequences of stratifications, and methods of studying stratification.

152. History of Social Thought (3)
Prerequisite: Soc 1 or permission of instructor. History of sociological theory: major theoretical schools and important theorists.

153. Contemporary Sociological Theory (3)
Prerequisite: Soc 1, 152, or permission of instructor. Nature of theory and its verification; critical examination of current theoretical formulation.

157. Social Change (3)
Prerequisite: Soc 1 or permission of instructor. Analysis of trends in and process, directions, and patterns of social change.

158. Seminar: Sociology of Knowledge (3)
Prerequisite: Soc 1, 152, 153, or permission of instructor. How social processes affect what is to be considered "knowledge" and the attainment of "knowledge." Research papers required.

159. Sociology of Religion (3)
Prerequisite: Soc 1 or permission of instructor. Major sects, denominations and churches; integrative and disintegrative processes in the United States; contemporary religious phenomena. (1 lecture, 4 lab hours)

161. Population Analysis (3)
Prerequisite: Soc 1 or permission of instructor. Population theories and history; demographic processes and variables in contemporary society. Analysis of census data.

162. Social Psychology (3)
Not open to students with credit in Psych 145. Prerequisite: Soc 1 or permission of instructor. A multiple systems approach to personality; analysis of the effect of social and psychological variables; attitudes, social perceptions, collective behavior, conformity, and leadership.

163. Urban Sociology (3)
Prerequisite: Soc 1 or permission of instructor. The urban concept; form and development of urban areas; scientific study of urban places and populations; effect of urbanization on social institutions and social relations.

164. Political Sociology (3)
Prerequisite: Soc 1 or permission of instructor. Political pressures and the social bases of power in society; the role of classes, groups, institutions and social values in political behavior.

165. The Family (3)
Prerequisite: Soc 1 or permission of instructor. The family in historic and contemporary society, theoretical frameworks for analyzing the family, family dynamics; changes in family functions, structures, and roles.

167. Seminar in Self and Society (3)
Prerequisite: Soc 1, 162, or Psych 145 or permission of instructor. Analysis of the relation of the self-system to society; symbolic interaction theory; role identity and social interaction; types of self developed under varying social conditions.

175. Seminar in Sociological Research Methods (3)
Prerequisite: Soc 1 and 25 or permission of instructor. Analysis of selected published research; individual field research and reports.

181. Seminar in Small Groups (3)
Prerequisite: Soc 1, 162, or permission of instructor. Microsociology; group types and basic processes. Effects of selected variables: group size, composition, task difficulty, role allocation, communication networks. Experimental research and reports.

183. Mass Society and Communications (3)
Prerequisite: Soc 1, 145 or 163, or permission of instructor. Analysis of social conditions producing mass society; its characteristics; communication systems; mass media and opinion formation.

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

SPEECH COMMUNICATION DEPARTMENT

Professors: Campbell, Taylor

Associate Professors: Hennings (Chairman), Fulkerson, W. Henderson

Assistant Professors: G. Anderson, Bloom, Bochin, Cagle, Diestel, Natharius, Quadro, Ullmann

Lecturer: Cronkite

Part-time: Hansen

The Speech Communication department offers courses leading to a bachelor of arts degree with a major or minor in speech communication and master of arts degree in speech arts.

The curriculum is designed to provide areas of concentration appropriate to prepare students for careers in teaching, communication professions, public service and administration, and industrial communication management. The departmental major and minor requirements include courses relating to rhetorical and communication theories. The department affords the student majoring in fields other than speech many courses which focus upon communication factors as they apply to any field of study. Students planning to pursue graduate work in speech communication should consult their advisers and the graduate schools of their choice regarding requirements for admission and should plan to use their electives within the major largely to satisfy such requirements.

In addition to departmental programs, many courses are offered which fulfill general education requirements and which provide the knowledge and background necessary to enjoy and contribute to our free society.

SPEECH TEST

For credential candidates. See *General Information—Entrance Examinations* and *School of Education—Admission to Credential Program.*

MAJOR AND MINOR

Both the speech communication major and minor are offered with two options. Option I is designed to provide competencies in rhetoric and communication for students who intend to pursue study beyond the bachelor of arts degree, and who are preparing for careers in secondary teaching, communication professions, public service and administration and industrial communication management. Option II is primarily designed to provide competencies for students who desire an interdepartmental major in speech arts to fulfill the academic major requirements for an elementary education credential, and for students in child development, child psychology, communicative disorders, home economics, recreation, social welfare, and physical education.

MAJOR

Speech Option I *Units*

Spch 5, 7, 8, 15–115, 140, 142, 146 or 148, 160, 162, 166, 187 32

Approved upper division electives from speech (Credential candidates must have at least 24 upper division units in speech.), anthropology, criminology, economics, English, history, linguistics, philosophy, political science, psychology, sociology, journalism, business administration, marketing, drama, radio-television, communicative disorders, or any discipline from which a cohesive program can be selected 15

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Speech Option II

Spch 7 or 8, 134, 160, 162 13

Drama 31, 137, C D 101, 102 11

Approved electives 12

36

MINOR

Speech Option I	*Units*
Spch 5, 7, 8, 15 or 115, 142, 160, 162	20
	20

Speech Option II	
Spch 160, 162	6
Drama 31, 137, C D 101, 102	11
Approved electives	3
	20

CREDENTIAL PROGRAM

For information on the current credential program consult departmental advisers and School of Education, Advanced Studies Department. See the section on *Public School Credentials.*

MASTER OF ARTS DEGREE IN SPEECH ARTS

The graduate program for the master of arts degree in speech is based on the equivalent of the undergraduate major or minor in speech at Fresno State. From 18 to 24 of the 30 units required for the degree must be in speech. For specific requirements, consult the graduate adviser; for general requirements see *School of Graduate Studies* and the *Graduate Bulletin.*

MASTER OF ARTS DEGREE IN MASS COMMUNICATION

The graduate program for the master of arts degree in mass communication is an interdisciplinary degree program jointly offered by the journalism and radio-television faculties of the college. See *School of Graduate Studies—Mass Communication.*

GENERAL EDUCATION REQUIREMENTS

The following courses will satisfy general education requirements. *Area II:* Spch 7, 8, 142, 160. *Area III:* Spch 146, 148. *Area IV:* Spch 3. *Area V:* Spch 167. (See *General Education—Courses*)

COURSES

SPEECH COMMUNICATION (Spch)

3. Fundamentals of Oral Communication (3) (Former Speech 21)
Meets speech requirement in general education. Understanding and practicing the skills of oral communication; observation, organization, reasoning, transmission, listening, and problem solving through a series of prepared speeches.

5. Argumentation (3) (Former PAC, Spch 25)
Prerequisite: Spch 3 or permission of instructor. Logical analysis, evidence, reasoning, and proof used in arriving at rational decisions as demonstrated through presentation of public speeches and debates.

7. Persuasion (3) (Former PAC, Spch 24)
Prerequisite: Spch 3 or permission of instructor. Persuasion viewed as a social tool for resolving controversy and forming opinions through presentation of and listening to public speeches, group discussions, and panels.

8. Group Discussion (3) (Former PAC, Spch 26)
Prerequisite: Spch 3 or permission of instructor. Communication in group thinking and problem solving through preparation and presentation of panels and symposia on public issues.

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15. Forensics Laboratory (1–2; max total 4)
Prerequisite: permission of instructor. Experience in the presentation of debates, oral interpretation programs, persuasive and expository speaking. Intramural and intercollegiate competition in forensics.

66. Statistical Applications in Communication (3)
Introduction to elementary statistical concepts, correlation analysis, parametric and nonparametric tests; emphasis on the application of statistical procedures to communication research. (3 lecture, 1 lab hour)

103. Advanced Public Speaking (3) (Former PAC 174)
Prerequisite: Spch 3. Advanced principles of expository and persuasive speaking; development of skills through analysis, preparation, organization, and delivery of various types of speech.

105. Proseminar in Argumentation Theory (3)
Prerequisite: Spch 5 or permission of instructor. Analysis of the theories and techniques of argumentation, including models of argument, relationships between persuasion and argumentation, and the effects of argumentative discourse.

108. Communication and the Small Group (3)
Prerequisite: Spch 8 or permission of instructor. Analysis of group communication theories and their application to small group behavior in specific variables such as leadership, power, conflict-resolution, conformity, cohesiveness, and related group processes.

114. Communication in the Classroom (3) (Same as E Ed 158)
Prerequisite: permission of instructor. Study of the nature of classroom communication and its relationship to learning and instruction; management of speech and communication activities.

115. Advanced Forensics Laboratory (1–2; max total 6)
Prerequisite: permission of instructor. Experience in the presentation of debates, oral interpretation programs, persuasive and expository speaking. Intramural and intercollegiate competition in forensics.

134. Structure of English (3) (See Ling 134)

135. General Linguistics (3) (See Ling 135)

137. American English (3) (See Ling 137)

140. Rhetorical Theory (3) (Former PAC, Spch 125)
Examination and analysis of classical, renaissance, and modern rhetorical theory for the purpose of identifying the theories of speech.

142. Rhetorical Criticism (3) (Former PAC 175)
Examination of methods of the classical critics through the contemporary theorists in rhetorical criticism for the purpose of establishing standards for rhetorical analysis.

145. History of Public Address: Ancient (3)
Not open to students with credit in Spch 146 or PAC 170. Study of selected classical discourse. Special emphasis is given to the study of classical institutions within ambient societies.

146. History of Public Address: British (3)
The history and criticism of British public address from Pitt to modern times. Special emphasis is given to the social and political forces of the period.

148. History of Public Address: American (3) (Former PAC, Spch 171)
Not open to students with credit in Spch 124. Selections from speeches of great American speakers analyzed in a cultural, psychological, social, and historical context; historical-rhetorical method of speech criticism.

149. Black Rhetoric (3) (Former Spch 188.4)
Discussion of the origin, context, strategies, topics, and audience of the rhetoric of Black America.

160. General Semantics (3) (Former PAC, Spch 121)
Prerequisite: Spch 3 or permission of instructor. Study of the attempt to organize the findings of the sciences of men and to develop procedures for self-management of man as a symbol user; internalizing the procedures.

162. Proseminar in Interpersonal Communication (3) (Former PAC, Spch 126)
Prerequisite: Spch 3 or permission of instructor. Nature of the communication process; factors affecting the process and the individuals involved.

163. Social Influence and Attitude Change (3)
Prerequisite: permission of instructor. Discussion of research on the nature and effects of social influence, with special emphasis on attitude formation and change, conformity, behavior, "brainwashing", prejudice, and propaganda as functions of communication.

164. Communication Problems of Culturally Different (3)
Analysis of literature dealing with the relationship between the educational and social difficulties of the culturally different child and his communication abilities; individual research projects in current literature.

165. Computer Applications in Communication (3)
Spch 166 concurrent. Study and use of various computer systems available in the study of human communication: Fortran IV, coursewriter III, LISP, SNOBOL, *General Enquirer;* emphasis on processing verbal data.

166. Communication Research Methods (3)
Prerequisite: basic statistics or permission of instructor. Application of behavioral research principles to problems in quantification, design, and analysis of data in communication research.

167. Leadership in Groups and Organizations (3) (Former PAC, Spch 127)
Theory and practice of selected leadership variables in groups and organizations; functions of leadership in formal and informal structures, understanding and analysis of role-playing techniques.

168. Communication in Organizations (3)
Application of communication principles to the improvement of organizational efficency.

187. Seminar In Speech (3)
Prerequisite: senior standing and permission of instructors. A student colloquy to synthesize the undergraduate program in speech communication.

188T. Topics in Speech (1-3; max total 9)
Prerequisite: permission of instructor. Selected topics in speech communication.

189. Projects in Speech (2; max total 6)
Prerequisite: permission of instructor. Group projects in all phases of production in speech communication. (4 hours activity)

190. Independent Study (1-3; max see reference)
See *General Information—Independent Study.*

GRADUATE COURSES

(See *Course Numbering System—Definitions and Eligiblity.* See *Communicative Disorders for additional graduate courses.*)

200. Introduction to Graduate Study (3)
Prerequisite: minor or equivalent in area of specialization. Seminar in research procedures and materials in speech. Required of all majors in speech during the first semester of graduate work.

210. Graduate Survey in Speech Arts (3)
Prerequisite or concurrently: Spch 200, permission of instructor. Seminar in review and analysis of advanced literature in an area of specialization.

215. Seminar in Speech Arts (3; max total 9)
Prerequisite: speech minor or equivalent. Research and individually directed work on problems within one area of speech arts: theatre, interpretation, radio-television, public address, and communications.

220T. Seminar in Dramaturgy (3; max total 9 if no area repeated)
Prerequisite: permission of instructor. Principle theories and research in the phases of the theatre: acting, directing, history, criticism, aesthetics, playwriting, scene design, costume design, sound, lighting, architecture.

222. Seminar in Oral Interpretation (3)
Prerequisite: permission of instructor. Research and analysis in theories, methods, and trends in interpretation; individual projects in the development of materials and techniques; relationship to literature, drama, public address.

241. Seminar in Rhetorical Theory (3) (Former Spch 240.1)
Prerequisite: permission of instructor. A seminar which deals with the development of specific principles by selected theories.

242. Seminar in Contemporary Criticism (3) (Former Spch 240.2)
Prerequisite: permission of instructor. The role of rhetorical criticism in contemporary society.

243. Seminar in the History of American Public Address (3) (Former Spch 240.3)
Prerequisite: permission of instructor. A detailed study of selected men who have influenced political, religious, and social problems in American History.

244. Seminar in Contemporary Public Address (3) (Former Spch 240.4)
Prerequisite: permission of instructor. The study of contemporary figures in public address who have influenced political, religious, economic, and social problems in the 20th century.

262. Seminar in Communication Theory (3) (Former Spch 261.1)
Prerequisite: permission of instructor. An examination and evaluation of mathematical, philosophical, sociological, psychological, and rhetorical theories of human communication. Emphasis upon the assumptions and implications of various theories, models, and constructs.

263. Seminar in Small Group Communication (3) (Former Spch 261.2)
Prerequisite: permission of instructor. A critical examination of the scientific research in small group communication with emphasis on theories of group communication; research variables and methodologies. Implications of research findings for contemporary communication problems.

264. Seminar in Communication Research (3) (Former Spch 261.3)
Prerequisite: permission of instructor. The nature, implications and assumptions of methodologies in human communication research. Discussion of quantification, design, and statistical inference as they relate to experimental, quasi-experimental, descriptive, survey and case study methodologies.

290. Independent Study (1-3; max see reference)
See *General Information—Independent Study.*

299. Thesis or Project (2-6; max total 6)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES

See *Course Numbering System*

303. Topics in Speech (1-3; repeatable with different topics)

URBAN AND REGIONAL PLANNING DEPARTMENT

Professors: Tokmakian (Chairman), Elias, Fey

Associate Professors: D. Lee, Merchen

Assistant Professor: J. Levin

Lecturer: Pirofalo

Part-time: Capelle, Coell, Hanger, M. Martin, Oswald, Patnaude, Poster, Schlobohm, J. Webster

The Department of Urban and Regional Planning offers a professional program leading to the master's degree in city and regional planning. The program has a multidisciplinary approach which seeks to develop planners equipped to understand both the physical and social aspects of community development, particularly those needs uniquely associated with the region, the medium-sized community, and rural areas and their service centers. Elective courses applicable toward the degree are offered by the Art Department of the School of Humanities, the Economics, Geography, Political Science, Sociology, and Speech Communication Departments and the Ethnic Studies Program of the School of Social Sciences, the Psychology Department of the School of Natural Sciences, the Schools of Business, Education, Engineering, Professional Studies, and Social Work.

MASTER OF CITY AND REGIONAL PLANNING DEGREE

The master's degree program in city and regional planning requires 60 semester units of study designed as preparation for careers in planning at a responsible level. It accepts an undergraduate degree in a field related to planning, such as geography, political science, public administration, economics, sociology, architecture, or engineering as the necessary foundation for entrance. Other fields may be acceptable, depending on an evaluation of the candidate's record and career goals.

The program is composed of a professional planning core and related supportive subjects designed to provide a framework sufficiently broad for specialized or general practice. Generally, students in their first year follow a program which provides a common body of knowledge in planning theory, research methods, design, and professional practice. Beginning with the second semester and continuing into the second year, students are encouraged to consider a minor specialization. With the assistance of his adviser, a student may undertake work which emphasizes interest in social concerns, in planning research, in regional and environmental studies, or in urban planning, policies, and programs. Each candidate should consult the department chairman prior to formal application. Applicants must also meet the entrance standards of the School of Graduate Studies. See *School of Graduate Studies and the Graduate Bulletin.*

GENERAL EDUCATION REQUIREMENTS

The following course will satisfy general education requirements. *Area II:* U R P 100. (See *General Education—Courses.*)

COURSES

URBAN AND REGIONAL PLANNING (U R P)

100. Introduction to Urban and Regional Planning (3)
Prerequisite: junior standing. Theory and practice of urban and regional planning; role of planning in contemporary society; urban problems; introduction to concepts, literature, and history.

101. Urban and Regional Research Methods (3)
Prerequisite: junior standing. Review of mathematical processes, including algebra, and basic statistics; introduction to regression analysis, probabilities, gaming and simulation, and other methods of systems analysis; application of techniques to urban and broad area data.

102. History of Urban Development Form (3)
Prerequisite: junior standing. Historical survey of urbanization; the evolution of urban form, spatial structure and systems.

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103. Introduction to Urban Design (3)
Prerequisite: junior standing. Introduction to the tools and techniques of physical design and graphic presentation. Basic sources of design information, formulation of design programs and solutions; laboratory projects. (2 3-hour labs)

GRADUATE COURSES (U R P)

(See *Course Numbering System—Definitions and Eligibility*)

109GT. Presentation Techniques in Urban and Regional Planning (1; max total 3)
Prerequisite: concurrent enrollment in U R P 200 series courses. Topics in techniques and practice of oral, narrative and graphic presentation as related to urban and regional planning. (1 2-hour lab)

200. Seminar in Planning Theory (3)
Prerequisite: permission of instructor. The origin and evolution of cities and the urban region; the urbanization process; historical and contemporary problems and goals; theories of urban and regional planning; evolution of the general plan and comprehensive planning.

201A-B. Seminar in Planning Research (3–3)
Prerequisite: permission of instructor. (A) Program formulation, information systems methods of demographic, economic base and land use analysis; application to problems and projects. (B) Analytical techniques applied to transportation, housing, public facility and resource planning; applications to problems and projects.

202. Seminar in Elements of Design (3)
Prerequisite: permission of instructor. Theory of urban design and aesthetics, examination of underlying concepts and principles; case studies of historic and contemporary city designs and development of model forms.

203A-B. Practicum in Environmental Design (3–3)
Prerequisite: U R P 200 and 201A, or permission of instructor. Design of the physical environment; application of principles and theories in the preparation of limited scope and comprehensive plans; studies of spatial relationships; laboratory and field projects. (2 3-hour labs)

210. Seminar in Planning Process (3)
Prerequisite: U R P 200, 201A, 202 and 203A-B or permission of instructor. Goal and policy formulation; scheduling; methods of plan implementation; administration of laws and ordinances; role of politics and public relations in the decision-making process.

212. Seminar in Urban Renewal (3)
Prerequisite: U R P 200, 201A, 202, or permission of instructor. The growth, development and application of urban renewal as a concept and as a means to solution of the physical, social, and economic deterioration of urban areas; federal, state, and local agency interrelationships; political constraints.

215. Seminar in Land Development Controls (3)
Prerequisite: graduate standing, U R P 200, 202, 203A, 210 or permission of instructor. The application of the police power—zoning, subdivision regulations and other techniques—used to implement land development plans and policies; historical and contemporary case studies.

219T. Seminar: Topics in Urban Theory and Planned Change (1–3; max total 12)
Prerequisite: U R P 200, 201A or permission of instructor. Selected topics such as forces affecting urban development; means for guiding urban development; channels and spaces in the urban matrix; impediments to planned change; economic structure of the city and region; formulation and implementation of planning policy reflecting these considerations.

220. Seminar: Planning for Housing (3)
Prerequisite: graduate standing, U R P 200, 201A, 202 or permission of instructor. Housing problems in America; the role of local, state and federal government and private enterprise; planning for adequate housing, carrying out policies and programs.

230. Seminar in Planning for the Region (3)
Prerequisite: graduate standing, U R P 200, 201A, or permission of instructor. Regional planning—approaches and methods; goal and policy implications of resource development, utilization and conservation; strategies for planning; case studies.

231. Practicum in Planning for the Region (3)
Prerequisite: graduate standing, U R P 200, 201A, 230, or permission of instructor. Application of principles and theories to the preparation of plans for regional development. Supervised individual field project; laboratory preparation of individually supervised field work.

232. Seminar in Planning for Natural Resources (3)
Prerequisite: U R P 200, 201A, or permission of instructor. Planning with the natural environment to produce maximum benefits to society; techniques of soil, air, water, vegetative, and associated resource management; case studies and field projects.

235. Seminar in Environmental Law (3)
Prerequisite: U R P 200, 203A-B, 210 or permission of instructor. Contemporary environmental problems and programs; the interrelationship and impact of laws which affect and regulate the environment and its quality; case studies.

240. Seminar in Urban Design (3)
Prerequisite: U R P 202, 203A, or permission of instructor. Advanced and empirical study of urban design, environmental perception, and the person-environment relationship; supervised individual and group projects in the field and laboratory.

249T. Seminar: Topics in Environmental Design (1–3; max total 12)
Prerequisite: U R P 200, 202, 203A-B or permission of instructor. Selected topics such as man-environment relations; the development of community form; physiographic and cultural influences on urban design; design problems within the urban context; problems in policy making, implementation, and controls.

259T. Seminar: Topics in Public Services and Resource Management (1–3; max total 12) (Former U R P 225T)
Prerequisite: U R P 200, 201A, or permission of instructor. Public facilities and services planning including transportation; physical planning and programming aspects of water supply, liquid and solid waste management systems, and education facilities; development of goals, policies, and plans for open space, parks, recreation facilities, and resource management.

260. Seminar in Theory of Urban Development Process (3)
Prerequisite: U R P 201A or Geog 120, or permission of instructor. Theory of regional and urban spatial organization; economic, size, distance, political, and social theories of urban development; theory of modeling and gaming simulation.

261. Seminar in Development Process Simulation (3)
Prerequisite: U R P 201A, 260, or permission of instructor. Application of gaming and mathematical simulation techniques to the urban development process; research assignments, case studies, supervised projects.

270. Seminar in Social Communication (3)
Prerequisite: U R P 200, 201A, 203A-B, 280T, or permission of instructor. Theories, strategies and practices of social communication as related to urban planning and community development; information as a social change tool; the role of social planners in communication processes; case studies.

279T. Seminar: Topics in the Social Aspects of Planning (1–3; max total 12)
Prerequisite: U R P 200, 210, or permission of instructor. Selected topics such as patterns of response to social change and their implications for planning policy; the advocacy role in planning; social accounting systems for plan evaluation.

280T. Professional Planning Practice (2–5; max see below)
Maximum total 13 units; no more than 8 applicable toward degree. Prerequisite: U R P 200, 201A, 202, 203A-B, or permission of instructor. Individually supervised professional practice in a public agency: preparation and implementation of comprehensive urban and regional plans; study of interrelationships and roles of governments, public agencies, and private enterprise.

281T. Seminar in Planning Practice (1; max total 3)
Prerequisite: concurrent enrollment in U R P 280T, permission of instructor. Seminar to explore characteristics and problems of professional planning practice; written evaluations of work experience.

282T. Field Study of Selected Planning Topics (1–5; max total 6 if no topic repeated)
Prerequisite: permission of instructor. Field study of urban and regional phenomena in relation to urbanization, urban systems, housing, and resource development.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

291. Directed Readings in Urban and Regional Planning (1–3; max total 6)
Supervised independent reading in a selected topic related to urban and regional planning.

299. Planning Thesis (2–4; max total 4)
Prerequisite: see *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis for the master's degree.

SCHOOL OF SOCIAL WORK

GENERAL 411
GRADUATE DEPARTMENT OF SOCIAL WORK 412
SOCIAL WELFARE DEPARTMENT 415

1790 1 3 4 620

SCHOOL OF SOCIAL WORK

Irving B. Tebor, Acting Dean

Department	*Chairman*
Graduate Department of Social Work	No appointees yet
Social Welfare	Ganesha Visweswaran

The School of Social Work provides an undergraduate major in social welfare leading to the bachelor of arts degree, designed to prepare for beginning positions in social work, to provide preparation for graduate work, and to provide a broad education in liberal arts. The school offers a two-year graduate program of preparation leading to the professional master of social work degree.

Social welfare courses at the undergraduate level include integration of theoretical and applied materials with contributions from social work, law, sociology, political science, cultural anthropology, economics, and psychology.

Graduate social work courses are similarly integrated and include materials from medicine, and psychiatry as well. Additionally, graduate social work courses include content unique to social work, especially in methods, field instruction, and social welfare policies and services. The School of Social Work holds membership in the Council of Social Work Education. Both undergraduate and graduate programs are accredited by the Council.

The continuing education program seeks to serve professionally trained social workers, other workers, and aides employed in social welfare agencies in the five-county service area of the college by supplementing professional education and in-service training in order to improve the level of effectiveness of social workers and allied disciplines in practice and to provide learning opportunities for those persons desirous of career progress.

COOPERATING AGENCIES

Social agencies throughout the San Joaquin Valley participate in the social welfare and social work training programs by providing field experience and instruction: American Cancer Society; American Red Cross; Bel Haven Convalescent Hospital; California State Departments of Corrections, Human Resources Development, Social Welfare, Youth Authority. Fresno City: Community Analysis Division, Housing Conservation Division, Model Cities Program, Recreation Department, Fresno City College, Fresno City Unified School District, Fresno Community Hospital. Fresno County: Family Court, Mental Health Department, Probation Department, Welfare Department, Valley Medical Center, Fresno County Legal Services, Fresno County Welfare Rights Organization, Fresno State College Educational Opportunity Program. Housing Authorities of Fresno City and County, Kings Canyon Unified School District, Kings County Community Action Agency, Kings County Unified Schools, Kingsview Mental Health Services, La Colonia Head Start Center, Northside Psychiatric Hospital, Pinedale Boys Club, Planned Parenthood of Fresno, Tulare County Probation Department, Veterans Administration Hospital. In addition, other agencies cooperate in the program.

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GRADUATE DEPARTMENT OF SOCIAL WORK

Professors: Brigham, Costigan, Kapoor, Merrifield, Rich, Varley.

Associate Professors: Baumann, S. Bennett, Bonham, Drew, Emmal, Haire, A. Hogan, Jenkins, Kershaw, Lindberg, B. Moore, Mori, Moss, Ruhl, Van Veldhuizen, Woodcock.

Assistant Professors: Aguirre, Bates, Hatmaker.

Lecturers: Tabbert, S. Wright.

Field Faculty: Himes (NIMH), Plewka (VA) (part-time), Steiner (KVH).

MASTER OF SOCIAL WORK DEGREE

The master of social work degree prepares social workers for such areas as public welfare, child welfare, hospital social service, family service, child guidance, mental health, international social work, school social work, rehabilitative social work, social work in correctional programs, family planning, social administration, social welfare planning, social work in minority communities. Emphasis is on generic training of social workers rather than on specialization.

The graduate program requires two years of full-time enrollment. Eligibility for admission to the program is based on completion of a bachelor's degree, preferably in a social welfare major or with substantial preparation in the social sciences and psychology (although other patterns may be permitted); an acceptable score on the Graduate Record Examination Aptitude Test; specified grade point average at the undergraduate level; and academic and personal suitability for the field as determined by social work faculty.

The program includes alternate periods of full-time classroom study and intensive field instruction. Both class and field content cover direct services to individuals and small groups as well as work with communities and organizations. All degree students will be required to complete an individual thesis or an individual or group research project.

For further information, consult the Dean, School of Social Work. For general requirements see *School of Graduate Studies.* For detailed information about the graduate program at Fresno State College, see the *Graduate Bulletin,* available in the Office of the Dean, School of Graduate Studies.

SEQUENCE OF GRADUATE COURSES FOR MASTER OF SOCIAL WORK DEGREE

1st Semester (15 un): S Wrk 200, 220, 230, 240, 291 (3 un).

2nd Semester (16 un): S Wrk 201, 221, 231 (3 un), 250 (5 un), 292 (2 un).

3rd Semester (15 un): S Wrk 250 (10 un), 290 (1 un), 297 (2 un) or 299 (3 un), required elective (2 un).

4th Semester (14 un): S Wrk 202, 222, 232 (3 un), 290 (1 un), 297 (2 un) or 299 (3 un), required elective (2 un).

SOCIAL WORK (S Wrk)

GRADUATE COURSES

Note: Admission to the MSW program is prerequisite to all graduate courses unless otherwise stated. Exceptions may be authorized by the Dean.

200. Seminar in Social Welfare Policy and Services (3)
Social work philosophy, values and ethics; the evolving, changing relationship of social work and social welfare to changing socio-economic and political climate; social welfare as a social institution, evolving from aspects of social change and social responsibility.

201. Seminar in Social Welfare Policy and Services (3)
Further development and expansion of social welfare as a social institution concerned with the social functioning of a changing society; law in relation to social policy, services and administration; current policy and services.

202. Seminar in Social Welfare Policy and Services (3)
Current social welfare policy and services with emphasis on philosophy, values and ethics; current social issues in relation to social function and social responsibility.

220. Seminar in Human Behavior and Social Environment (3)
Growth processes and personality development within the family, group, and community; relationship of behavior and social functioning to native endowment and to environmental and cultural patterns.

221. Seminar in Human Behavior and Social Environment (3)
Adaptive and maladaptive behavior under environmental stress; health and disease, role and cultural factors, and group processes as determinants of social functioning.

222. Seminar in Human Behavior and Social Environment (3)
Social pathology; epidemiology and prevention of deviant behavior.

230. Seminar in Social Work Practice (3)
Introduction to the basic concepts and principles of social work practice.

231. Seminar in Social Work Practice (3)
Intermediate study of theory and methods of social work practice.

232. Seminar in Social Work Practice (3)
Advanced study of social work practice; theory and methods.

240. Seminar in Field Instruction Techniques (3)
Agency expectations and the role of the student in the agency. Beginning integration of theoretical knowledge for practice usage through laboratory experience and field trips. Emphasis on skill in interviewing, recording, and use of community resources.

250. Field Instruction (2–10; max total 18)
Instruction in the application of theories and concepts of social work practice; emphasis upon generic social work providing a balance between fields of practice, small and large systems, and functioning in different roles in organizational and community systems. One field placement each year of the graduate program.

273T. Seminar in Areas of Social Work Practices (2)
May be repeated with different topics. Prerequisite: permission of instructor. Theories and developments in the areas of child welfare, family welfare, income maintenance, community planning, community development, public health, mental health, international social welfare, corrections, schools, geriatrics, and rehabilitation.

280T. Seminar in Social Work Processes (2)
May be repeated with different topics. Prerequisite: permission of instructor. Knowledge and trends in casework, group work, community organization, administration, supervision, consultation, staff development, and research.

290. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

291. Seminar in Social Work Research (3)
Relation of research, theory, and practice in social work.

292. Seminar in Methods in Social Work Research (2)
Research design in social work; sampling; instruments for data collection; analysis and interpretation of data; nonparametric techniques.

297. Group Research Project (2–4; max total 4)
Prerequisite: S Wrk 292. Utilization of social work research principles and techniques to select study design, determine data collection techniques, collect and process data, interpret findings and prepare final written report. Standards same as thesis.

299. Thesis or Project (3–6; max total 6)
Prerequisite: S Wrk 292. See *Master's Degrees—Thesis Requirement.* Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

IN-SERVICE COURSES

(See *Course Numbering System.*)

300. Advanced Seminar in Social Work Practice (1–3)

301. Seminar in Selected Social Work Topics (1–3)

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SOCIAL WELFARE DEPARTMENT

Professor: Pickford

Associate Professors: Visweswaren (Chairman), Bonham, Ellis, Emmal

Assistant Professors: Bates, Hatmaker, Nunez

Lecturers: McKell, Tabbert

Part-time: Nichols

The Social Welfare Department offers a bachelor of arts degree with a major in social welfare designed to prepare students for employment in the helping fields, especially public welfare, voluntary community and group services, poverty programs, mental hygiene, services for children, the handicapped, the aged, and other special population groups, Peace Corps, VISTA, social rehabilitation, and human resources development.

BACHELOR OF ARTS DEGREE MAJOR IN SOCIAL WELFARE

	Units
S Wel 20, 121, 124, 127, 175, 180 (2 un), 181 (6 un)	23
Electives in: S Wel 12T, 130	9
	32

Additional Requirements: One 3-unit course from five of the following areas: anthropology, economics, ethnic studies, political science, psychology, sociology (15 units, at least 9 upper division). Three additional electives from the foregoing areas or from criminology or urban and regional planning (9 units, at least 6 upper division).

COURSES

SOCIAL WELFARE (S Wel)

20. Social Welfare (3)
Social, economic, political, historical, and philosophic components in development of social welfare and social work in western society.

121. Social Welfare Programs (3)
Prerequisite: S Wel 20 or permission of instructor. Major contemporary social welfare programs in the United States; basic principles of social security programs; roles of federal, state, and local governments.

122T. Topics in Social Welfare (3; max total 15)
Topics in fields of social work practice, basic social work theories and social work methods.

124. Proseminar in Interviewing (3)
Seminar emphasizing integration of behavioral and personality theories with principles of interviewing. Conduct, analysis and presentation of interviews, and case studies.

127. Proseminar in Group and Community Services (3)
Seminar in group and individual analyses and presentations of community problems and services.

130. Seminar in Social Work Processes (3)
Prerequisite: S Wel 20, 121, 124, and permission of instructor. Knowledge and trends in dealing with various client-systems including individual, group, and community.

175. Seminar in Social Work Research (3)
Prerequisite: S Wel 20. Research design in social work; sampling, instruments for data collection, analysis, and interpretation of data.

180. Training in Public Services (1-2; max total 5)
Prerequisite: S Wel 20 and permission of instructor. Planned and supervised experience or study in a field of occupational specialization.

181. Supervised Social Welfare Field Experience (1–6; max total 12)
Prerequisite: second semester junior standing; S Wel 20 and permission of instructor. Observation, orientation and participation in operations of private or public social welfare agencies. (Minimum of 3 field hours per unit.)

190. Independent Study (1–3; max see reference)
See *General Information—Independent Study.*

FACULTY AND ADMINISTRATION, 1971–1972

FULL-TIME STAFF 419
PART-TIME STAFF 448
EMERITI 453

14—83030

1815 1 3 5 105

FACULTY AND ADMINISTRATION, 1971–1972

Note: Numbers in parentheses indicate year of appointment at Fresno State.

BAXTER, NORMAN A. (1969), President; Professor of History
AB, Taylor University; BD, New York Theological Seminary; PhD, Harvard University.

ABOU-GHORRA, IBRAHIM (1956), Professor of Psychology
BA, Cairo University; Diploma, Ain Shams University (Egypt); Diploma, Cairo Institute of Higher Studies; MA, Ohio State Univerity; PhD, University of Southern California; Licensed Psychologist.

ADAMS ROBERT C. (1965), Associate Professor of Radio-Television
BA, Idaho State College; MA, PhD, University of Oregon.

AGNEW, ALLEN M. (1965), Professor of Office Administration
BA, MA, San Jose State College; EdD, University of California at Los Angeles.

AGUIRRE, MANUEL E. (Spring 1969), Assistant Professor of Social Work (LCC)
BA, Fresno State College; MSW, University of California.

AIKEN, JOYCE B. (1956–1957; 1958–1959; Spring 1962), Associate Professor of Art
BA, MA, Fresno State College.

ALBRIGHT, W. DONALD (1958), Counselor
BS, Northeast Missouri State Teachers College; MEd, University of Missouri; EdD, Teachers College, Columbia University.

ALDEN, H. LEE, JR. (1960), Assistant Professor of Radio-Television
BA, University of Virginia.

ALDRICH, LESLIE L. (1955), Professor of Industrial Arts and Technology
BA, Willamette University; MA, Oregon State College.

ALI, MIR K. (1968), Associate Professor of Mathematics
BS, MA, Osmania University; MS, Montana State University; PhD, Washington State University.

ALLEN, DERYLE K. (1961), Director of Counseling and Testing
BA, Southwestern State College (Oklahoma); MEd, EdD, University of Oklahoma.

ALLEN, ROGER W. 1959–1961; 1963–1966; 1970), Professor of Management and Marketing
MBA, University of Chicago; DBA, University of Southern California.

ALLEN, TERRENCE L. (1971), Lecturer in Art
BFA, Chouinard Art Institute.

ALLISON, ROBERT J. (1967), Associate Professor of Economics
BA, MS, PhD, University of Colorado.

ANDERSON, DAVID C. (1966), Associate Professor of Management and Accounting.
BS, MS, West Virginia University; DBA, Georgia State University.

ANDERSON, LAWRENCE L. (1971), Assistant Professor of Art
BA, MA, San Jose State College.

ANDERSON, MYRON M. (1937), Professor of Physical Education
BA, Fresno State College; MA, University of Southern California.

ANDERSON, R. GENE (1970), Assistant Professor of Speech Communication
BA, MA, Baylor University; PhD, University of Colorado.

ANTONAKOS, STEPHEN (1971), Lecturer in Art

ARCE, GINA (1957), Professor of Botany
BA, MA, George Peabody College; PhD., Vanderbilt University.

ARNOLD, ROBERT F. (1968), Assistant Professor of Mathematics
BS, MA, Fresno State College; PhD, University of California at Berkeley.

ASHOUR, AHMED A. (1969), Assistant Professor of Management
BComm, Ain Shams University (Egypt), MAPA, PhD, University of Minnesota.

AUDET, NOEL (1971), Lecturer in Foreign Languages
BA, College Bourget; Licence es Lettres, Universite Laval; PhD, Universite de Paris.

AUSTIN, ELLIS T. (1958), Professor of Finance; Acting Chairman, Finance and Industry Department (spring)
BA, University of Washington; PhD, Michigan State University.

AVAKIAN, ARRA S. (1970), Professor of Ethnic Studies
SB, ScD, Massachusetts Institute of Technology.

AVEDISIAN, NORMA L. (1969), Assistant Professor of Education
BA, MS, EdD, University of Nebraska.

AVENT, CAROL L. (1966), Associate Professor of Nursing
BA, Boston University; MS, University of Colorado.

AVENT, JON C. (1965), Associate Professor of Geology
BS, University of Colorado; MS, PhD, University of Washington.

AVERY, GEORGE E. (1959), Associate Professor of Education
BS, Colorado State University; EdD, University of Maryland.

AYER, SALLY L. (1971), Assistant Professor of Physical Education and Recreation
BA, Colorado State College; MA, Northern Arizona University.

BADR, SAYED A. (1970), Assistant Professor of Plant Science
BS, Ain-Shams University (Egypt); MS, PhD, University of California at Davis.

BAILEY, EVA G. (November 1962), Professor of Nursing
BS, University of Arizona; MS, University of California at Los Angeles; Registered Nurse.

BAILEY, ROGER L., (1970), Test Officer
BA, Southwestern College; MS, PhD, University of Kansas.

BAKKEGARD, BENJAMIN M. (1958), Professor of Music
BS, University of North Dakota; MEd, University of Minnesota; EdD, Teachers College, Columbia University.

BALDIS, BETTE J. (1971), Assistant Professor of Communicative Disorders
BEd, MS, Illinois State University.

BALL, WILBUR P. (1958), Professor of Agriculture and Education
BS, MEd, Colorado State University; PhD, Iowa State University.

BALLARD, O. DUANE, JR. (1968), Assistant Professor of Physical Education
BS, MS, Brigham Young University.

BALLOU, STEPHEN V. (1953), Professor of Education
BEd, Duluth State Teachers College; MA, EdD, University of Colorado.

BARNHART, KENNETH E., JR. (1958), Professor of Engineering
BS, MS, PhD, University of California.

BARNOUTI, SOUAD N. (1969), Assistant Professor of Management
BA, University of Baghdad; MBA, University of California at Los Angeles; ACII, Chartered Institute of London; PhD, University of California at Berkeley.

BARTA, JOHN M. (1968), Assistant Professor of Foreign Language
BA, MA, University of California at Los Angeles.

BASDEN, DAVID R. (Spring 1969), Assistant Professor of Psychology
BA, College of Idaho; PhD, University of California at Santa Barbara.

BATES, DAVID S. (1971), Assistant Professor of Music
BM, MM, University of Michigan.

BATES, JAMES E. (1967), Assistant Professor of Social Work (KCCAC)
BA, Gonzaga University; MSW, University of Washington.

BATHURST, LEONARD H., JR. (1954), Director of Instructional Media Center; Professor of Education
BA, MEd, EdD, Pennsylvania State University.

BAUER, ANN S. (1968), Assistant Professor of Home Economics
BA, Whittier College.

BAUMANN, PATRICIA M. (1967), Associate Professor of Social Work (NIMH)
BA, Fresno State College; MSW, Boston College.

BAUMGARTNER, MARGARET M. (1963), Professor of Nursing
BS, San Francisco College for Women; MS, University of California at San Francisco.

BEACH, PHILIP F. (1964), Associate Professor of Political Science
BA, Uniiversity of Washington; MA, PhD, Northwestern University.

BEATTY, WILLIAM C., JR. (1947), Professor of Social Science
BA, University of Denver; MA, University of Colorado; PhD, University of Southern California.

BEDROSIAN, CAROL A. (1971), Lecturer in Nursing
RN, Fresno City College; BS, MS, Fresno State College.

BEDROSIAN, SARAH G. (1959–1960; 1962), Professor of Finance and Quantitative Studies
BA, MA, Fresno State College; DBA, University of Southern California.

BELL, DAVID G. (1971), Dean of Student Affairs
BME, Milton College; MS, PhD, University of Wisconsin.

BELL, JESSE T. (Spring 1948), Professor of Animal Science; Chairman, Animal Science Department
BS, Texas College of Arts and Industries; MA, Sul Ross State College.

BENITEZ, FRANK (1971), Assistant Professor of Foreign Language
BA, Zaragoza Philosophy College; MA, Fresno State College; PhD, University of California at Riverside.

BENKO, STEPHEN (1969), Associate Professor of History
BD, Theological Academy, Budapest; PhD, University of Basel (Switzerland).

BENNETT, BOB G. (1969), Head Coach, Physical Education
AB, MA, Fresno State College.

BENNETT, BOB L. (1955), Professor of Music
BA, Fresno State College; MS, Juilliard School of Music; DMA, Stanford University.

BENNETT, SUSAN F. (1967), Associate Professor of Social Work
BEd, University of Hawaii; MSW, New York School of Social Work.

BENSON, RAY (1964), Professor of Business Law
BA, Long Island University; JD, Fordham University; MBA, PhD, University of California at Los Angeles.

BERESKIN, S. ROBERT (1969), Assistant Professor of Geology
BS, University of Southern California; MA, PhD, University of California at Santa Barbara.

BERG, EDWARD (1969), Director of Allied Health Professions; Professor of Biology
BA, Brooklyn College; PhD, Cornell University.

BERGEY, JOHN (1961), Professor of Nursing
BS, Yankton College; MA, University of Pittsburgh; Registered Nurse.

BERRETT, RICHARD D. (1969), Assistant Professor of Home Economics
B.S., Brigham Young University.

BERRY, SARA C. (1957), Librarian III
BA, Occidental College.

BERTOLDI, ALLEN E. (1968), Assistant Professor of Art
BA, Fresno State College.

BESSARD, CHRISTINE (1969), Lecturer in Ethnic Studies
BA, Fresno State College

BEST, HAROLD L. (1970), Director of Institutional Research; Professor of Management and Marketing.
BA, MA, PhD, George Washington University; Licensed Psychologist.

BEST, JOEL G. (1970), Assistant Professor of Sociology
BA, University of Minnesota; MA, PhD, University of California at Berkeley.

BEVANS, BONNIE JO (1970), Associate Professor of Physical Education and Recreation
BA, University of California at Santa Barbara; MA, Fresno State College.

BEVILL, VINCENT D. (1957), Professor of Engineering
BS, Fresno State College; MS, University of California at Davis; Registered Mechanical Engineer.

BIECHLER, MICHAEL J. (1970), Assistant Professor of Geography
BS, Eau Claire State University; MA, PhD, Michigan State University.

BIEHLER, WAYNE E. (1951), Professor of Agronomy
BS, Fort Hays Kansas State College; MS, University of California at Davis.

BIGGE, MORRIS L. (1950), Professor of Educational Foundations
BA, Washburn Municipal University; MS, University of Michigan; PhD, University of Kansas.

BIGGERSTAFF, WARREN R. (1948), Professor of Chemistry
BA, Willamette University; MS, Oregon State College; PhD, University of Wisconsin.

BILDERBACK, D. LOY (1962), Professor of History
BA, MA, University of Kansas; PhD, University of Washington.

BILLINGS, ROBERT S. (1957), Professor of English
BA, University of New Hampshire; MA, Boston University; PhD, State University of Iowa.

BJERK, ROGER C. (1969), Assistant Professor of History
BA, Pacific Lutheran University; MA, PhD, Washington State University.

BLACKERBY, BRUCE A. (1963), Professor of Geology; Chairman, Geology Department
BA, University of California at Riverside; PhD, University of California at Los Angeles.

BLANKENSHIP, GERALD, JR. (1967), Associate Professor of Business Law
BA, JD, University of Southern California; Member, California State Bar.

BLANTON, RONALD L. (1965), Associate Professor of Industrial Arts and Technology
BA, MA, Fresno State College.

BLISS, WILLIAM H. (1950), Professor of Industrial Arts and Technology
BS, Central Missouri State College; MA, University of Northern Colorado; EdD, Bradley University.

BLOMGREN, GLEN H. (1962), Associate Professor of Industrial Arts and Technology
BA, MA, Fresno State College.

BLOOD, KENNETH H. (1966), Counselor
BA, Hamline University; MS, PhD, Washington State University.

BLOOM, VINCENT L. (1970), Assistant Professor of Speech Communication
BA, Bethel College; MA, Colorado State College; PhD, Ohio University.

BLUESTEIN, GENE (1963), Associate Professor of English
BA, Brooklyn College; MA, PhD, University of Minnesota.

BLUESTONE, SYDNEY (1963), Professor of Chemistry
BS, Brooklyn College; PhD, Rutgers University.

BOARD, ROBERT R. (1964), Registrar
BS, University of Santa Clara.

BOCHIN, HAROLD W. (1969), Assistant Professor of Speech Communication
BS, John Carroll University; MA, University of Wisconsin; PhD, Indiana University.

BODGER, W. KENNETH (1968), Associate Professor of Engineering
BS, MS, Massachusetts Institute of Technology.

BOFFMAN, JUNE L. (1971), Lecturer in Nursing
BSN, MSN, University of California Medical Center at San Francisco.

BOHNERT, SHIRLEY M. (1970), Assistant Professor of Nursing
BSN, Nazareth College; MSN, Boston College.

BOHNSTEDT, JOHN W. (1956), Professor of History
BA, Michigan State University; MA, PhD, University of Minnesota.

BONHAM, CLIFFORD V. (1964), Associate Professor of Social Work
BA, MSW, University of California.

BOOLSEN, FRANK M. (1948), Professor of Criminology; Chairman, Criminology Department
BA, MA, University of California.

BOURDET, J. GENE (1971), Professor of Physical Education and Recreation; Chairman, Physical Education and Recreation; Director of Athletics
BS, ME, Montana State University.

BOWDEN, SHIRLEY J. (1968), Assistant Professor of Home Economics
BS, University of California at Los Angeles; MS, Fresno State College.

BOWEN, THOMAS G. (1969), Assistant Professor of Anthropology
BA, Grinnell College; MA, PhD, University of Colorado.

BOWEN, WAYNE S. (1964), Associate Professor of Foreign Languages
BA, Ohio State University; MA, Emory University (Georgia); PhD, Ohio State University.

BRADLEY, BEATRICE E. (1969), Associate Professor of Education
BS, MS, EdD, University of Pennsylvania.

BREEN, THOMAS E. (1966), Associate Professor of Psychology
BS, University of Illinois; MA, PhD, Louisiana State University.

BREMNER, RAYMOND W. (1947), Professor of Chemistry
BS, MS, PhD, University of Washington.

BRENGELMAN, FREDERICK H. (1957), Professor of Linguistics
BA, Dana College; MA, University of Nebraska; PhD, University of Washington.

BRENNER, ROBERT D. (1968), Associate Professor of Education
BA, Ottawa University; MA, EdD, Northern Colorado University.

BRENNINGER, RALPH A. (1946), Professor of Foreign Languages
BS, Lafayette College; MA, Columbia University; PhD, University of California.

BREWER, RAY E. (1965), Associate Professor of Education
BS, Kansas State University; MA, New Mexico State University; EdD, University of Arizona.

BRIGGS, CHARLES R. (1970), Assistant Professor of Health Science
BS, Beloit College; MPH, School of Public Health, University of Minnesota.

BRIGGS, DOUGLAS M. (1969), Assistant Professor of Theatre Arts
BA, MA, San Francisco State College.

BRIGHAM, THOMAS M. (1953), Professor of Social Work
BA, San Francisco State College; MSW, University of California; Registered Social Worker.

BROCK, RICHARD K. (1966–1971; Spring 1972), Associate Professor of Marketing
BA, MBA, University of Washington.

BRODERICK, LEO J. (1967), Counselor, Psychiatrist
BS, St. Joseph's College; MD, Hahnemann Medical College.

BROOKS, ROBERT S. (1967), Director of Housing
BA, University of Colorado; MEd, Ohio University.

BROOKS, WAYNE A. (1956), Professor of Business Law
BA, St. Ambrose College; JD, University of Iowa; LLM, Stanford University; Member, Iowa Bar, California Bar.

BROOKS, WENDELL H. (1970), Assistant Professor of Ethnic Studies
BA, Whittier College; MSSc, Uppsala University, Sweden.

BROUWER, JAMES M. (1964), Assistant Professor of History; Director, Experimental College
BA, MA, Yale University.

BROWN, SHELDON J. (1956), Professor of Physics
BA, PhD, University of California at Los Angeles.

BROWNELL, JAMES R. (1969), Associate Professor of Soils
BS, Pennsylvania State University; MS, University of Minnesota; PhD, University of California at Davis.

BROYLES, DON R. (1968), Assistant Professor of Political Science
BA, Sacramento State College; MA, PhD, Claremont Graduate School.

BRUM, JAMES F. (1970), Assistant Professor of Accounting and Quantitative Studies
BA, St. John's University; MBA, St. Cloud State College.

BRYON, JEANETTE P. (1956), Associate Professor of Theatre Arts
BA, University of Maine; MA, University of North Carolina.

BURDICK, DONALD J. (1960), Professor of Biology
BA, San Jose State College; PhD, University of California.

BURGER, O. J. (1969), Dean, School of Agricultural Sciences; Professor of Agronomy
BS, MS, PhD, Purdue University.

BURGESS, ROBERT C. (1947), Professor of Physical Education
BA, Fresno State College; MS, University of Southern California.

BURRISS, MERLYN D. (1947; 1953), Professor of Radio-Television
BA, Fresno State College; MA, University of California at Los Angeles.

BURTNER, DALE C. (1958), Professor of Chemistry
BA, Reed College; MS, PhD, University of Washington.

BURTON, BENJAMIN B. (1958), Professor of Psychology
BA, MA, PhD, University of Missouri; Licensed Psychologist.

BUSH, P. DALE (1961), Associate Professor of Economics
BA, MA, University of Denver; PhD, Claremont Graduate School.

BUTTON, ALAN D. (1961), Professor of Psychology
BS, MA, University of Oregon; PhD, Stanford University.

CADY, DOROTHY A. (1954), Lecturer in Elementary Education
BS, University of Minnesota; BA, MA, Fresno State College; Registered Nurse.

CAGLE, JOHN A. (1970), Assistant Professor of Speech Communication
BA, MA, San Fernando Valley State College.

CAID, JOANNE N. (1967), Associate Professor of Home Economics
BS, Rochester Institute of Technology; MS, Michigan State University.

CAMPBELL, HOWARD J. (1946), Professor of Speech Communication
BS, North Texas State Teachers College; MA, Stanford University; EdD, University of California.

CANALES, JOSE C. (1946), Professor of History
BA, Manhattan College; MA, PhD, University of California.

CARBAJAL, FRANK J. (1969), Assistant Professor of Physical Education and Recreation
BA, Colorado State College; MS, Utah State University.

CARR, JOHN H. (1953), Professor of Microbiology
BS, Kansas State Teachers College; MS, PhD, Kansas State College.

CARR, ROBERT A. (1952–1956; 1957), Professor of Finance and Industry; Chairman, Finance and Industry Department
BA, MA, San Francisco State College; PhD, University of Southern California.

CASPERSON, DONALD G. (1970), Assistant Professor of Health Science
BA, Ohio Wesleyan University; MEd, Xavier University; HSD, Indiana University.

CHA, MARN J. (1969), Assistant Professor of Political Science
BA, MPA, PhD, University of Southern California.

CHAKALOZIAN, ALICE (1971), Lecturer in Nursing
BS, Fresno State College.

CHANG, SIDNEY H. H. (1966), Associate Professor of History
BA, National Taiwan University; MA, University of Missouri; MS, Florida State University; PhD, University of Wisconsin.

CHANG, TSAI YU LILLIAN (1966), Associate Professor of Nursing
BS, University of Soochow (China); MPH, University of Michigan; MS, University of California at San Francisco; RN; SCM, England.

CHEUK, S. FAI (1970), Assistant Professor of Biology,
BSc, MSc, University of Manitoba; PhD, McGill University.

CHITTICK, ROGER D. (1956), Professor of English
BA, Butler University; MA, Washington State College; PhD, Stanford University.

CHRISTENSEN, ELWYN L. (1968), Associate Professor of Accounting
BA, Andrews University; MAcct, DBA, University of Southern California; CPA.

CHRISTENSEN, JACK D. (1968), Assistant Professor of History
BA, University of California; MA, Fresno State College.

CHRISTISON, CHESTER E. (1970), Assistant Professor of Industrial Arts and Technology
BS, Mankato State College; MA, Colorado State College.

CIULA, RICHARD P. (Spring 1961), Professor of Chemistry
BA, Bowling Green State University; MS, University of California; PhD, University of Washington.

CLAASSEN, ALFRED J. (1969), Assistant Professor of Sociology
AB, University of California.

CLARK, A. ZANE (1968), Librarian III
BS, Utah State University; MA, University of Denver.

CLARK, DAVID E. (1950; 1953), Associate Vice President for Academic Affairs; Professor of Chemistry
BA, University of Redlands; MS, PhD, Stanford University.

CLARK, TRUMAN B. (1970), Associate Professor of Biology
BA, MS, PhD, University of Minnesota.

CLOUGH, CARMEN P. (1963), Associate Professor of Foreign Languages
DrPed, University de la Habana; MA, University of Michigan.

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COE, WILLIAM C. (1966), Associate Professor of Psychology
BS, University of California at Davis; PhD, University of California; Licensed Psychologist.

COFFEY, JACK (1968), Assistant Professor of Office Administration
BA, Nebraska State College; MA, PhD, University of Northern Colorado.

COHEN, MOSES E. (1969), Associate Professor of Mathematics
BS, Sir John Cass College, London University; PhD, University College of South Wales.

COKER, WILSON W. (1968), Professor of Music; Chairman, Music Department
BM, MM, Yale University; BM, St. Louis Institute of Music; DMA, University of Illinois.

COLBERT, JAMES D. (1969), Coach, Physical Education
BA, MA, Adams State College.

COLE, CHESTER F. (1947), Professor of Geography
BA, Eastern Washington College of Education; MA, University of Washington; PhD, University of Nebraska.

COLVER, A. WAYNE (1957), Professor of Philosophy
BA, University of California at Los Angeles; MA, PhD, Harvard University.

COMEGYS, ROBERT G. (1955), Professor of History
BA, MA, University of Washington; PhD, Stanford University.

CONRAD, PETER W. (1970), Lecturer in Physical Education and Recreation
BA, Fresno State College.

CONTRERAS, CARLOS A. (1968), Assistant Professor of History
BA, Brigham Young University; MA, Unversity of California at Los Angeles.

COOK, JOHN E., JR. (1970), Lecturer in Industrial Arts and Technology
BA, MA, Fresno State College.

COOPER, ARNOLD M. (1957), Professor of Psychology
BA, San Francisco State College; MA, PhD, Claremont Graduate School; Licensed Psychologist.

CORCORAN, WILLIAM H. (1971), Assistant Dean of Student Affairs
BA, MA, San Fernando Valley State College.

CORDS, DOUGLAS A. (1969), Assistant Professor of Marketing
BS, MBA, Fresno State College.

COSTIGAN, BARBARA H. (1969), Professor of Social Work
BA, University of Southern California; MSW, University of Pennsylvania; DSW, University of Southern California.

COSTIS, HARRY G. (1967), Professor of Statistics and Quantitative Methods
BS, University of Athens; MS, University of Georgia; PhD, University of Texas.

COUGHRAN, WILLIAM M. (1959), Director of Personnel
BA, MA, Fresno State College.

COWLING, SANDRA L. (1967), Librarian IV
BA, MA, Indiana University.

COWLING, WILLIAM H. (1967), Associate Professor of English
BA, Loyola University; MA, PhD, Indiana University.

CRANE, GERALD B. (1970), Assistant Professor of English
AB, MA, University of California at Davis.

CRONKHITE, GARY L. (1971), Lecturer in Speech Communication
BA, Greenville College: MS, Illinois State University; PhD, University of Iowa.

CROSBY, JOHN A. (1956), Professor of Geography
BS, University of Chicago; MA, PhD, University of Washington.

CSERNA, EUGENE G. (Spring, 1959), Professor of Geology
PhD, University of Sciences (Budapest, Hungary); MA, PhD, Columbia University.

CULLEN, CLIFT C. (1969–1970; 1971), Assistant Professor of Industrial Arts and Technology
BA, MA, Fresno State College.

CUMMINS, JAN L. (1968), Assistant Professor of Home Economics
BS, MS, Fresno State College.

CYPHER, JAMES M. (1967), Assistant Professor of Economics
BA, MA, University of California at Santa Barbara.

DACKAWICH, S. JOHN (1970), Professor of Sociology; Chairman, Sociology Department
BA, University of Maryland; PhD, University of Colorado.

DAMM, MARVIN V. (1971), Lecturer in Engineering
BS, Fresno State College; MS, University of California at Berkeley.

DANDOY, MAXIMA A. (Spring, 1956), Professor of Education
BSE, National Teachers College (Philippines); MA Arellano University (Philippines); EdD, Stanford University.

DANGELO, DAVID J. (1970), Assistant Professor of Art; Director of Exhibits
BA, Sacramento State College.

DARGAHI, GHOLAM H. (1967–1968; 1970), Associate Professor of Political Science
BA, University of Tehran (Iran); MA, University of Denver; PhD, University of Utah.

DAUBS, EDWIN H. (1963), Associate Professor of Biology
BS, MS, PhD, University of Illinois.

DAVIS, DELMER I. (1970), Assistant Professor of Animal Science
BS, Abilene Christian College; PhD, University of Tennessee.

DAVIS, IRVING F., JR. (1960), Professor of Agricultural Economics
BS, University of California; MS, University of Illinois; PhD, University of California.

DAVIS, MARTHA A. (1960), Associate Professor of Nursing
BS, St. Louis University; MA, Teachers College, Columbia University; Registered Nurse.

DAVIS, VIOLA A. (1955), Counselor
BA, Pasadena College; MA, University of Southern California; PhD, Northwestern University.

DELANEY, RICHARD W. (1965), Associate Professor of Art
BA, MA, San Francisco State College.

DEMING, DONALD E. (1960), Associate Professor of Engineering
BS, Worchester Polytechnic Institute; MS, University of Connecticut.

DEMPSTER, FRED E. (1951), Professor of Music
BA, University of Omaha; MMus, Northwestern University.

DENTON, CHARLES F. (1971), Associate Professor of Political Science; Dean, School of Social Sciences
BA, University of the American, Mexico; MA, PhD, University of Texas at Austin.

DETTINGER, DONALD J. (1947), Professor of Industrial Arts and Technology
BA, Chico State College; MS, Oregon State College.

DEWS, JON R. (1965), Associate Professor of Physics
BS, Fresno State College; PhD, University of California.

DICK, CHARLES H. (1969), Assistant to the President for Community Relations (fall)
AB, University of Kansas; MA, Canisius College; MS, Fresno State College.

DIENSTEIN, WILLIAM (1946), Professor of Sociology and Criminology
BA, Stanford University; MA, University of California; PhD, Stanford University.

DIESTEL, GEORGE E. (1969), Assistant Professor of Speech Communication
BA, St. Mary's College; MA, Fresno State College; PhD, University of Southern California.

DILDEY, DOUGLAS D. (1971), Assistant Professor of Animal Science
BS, Colorado State University; MS, PhD, Purdue University.

DILL, DOUGLAS L. (1969), Assistant Professor of Journalism
BS, Brigham Young University; MAJ, Marshall University.

DINKIN, ROBERT J. (1968), Assistant Professor of History
BA, Brooklyn College; MA, PhD, Columbia University.

DINTRONE, CHARLES V. (1968), Librarian II
BA, MA, University of California at Los Angeles; MLS, University of California.

DMITRIEW, HELEN L. (1967), Associate Professor of Foreign Languages
MA, University of Iowa.

DODDS, J. PARRY (1964), Professor of Agricultural Economics
BS, MS, PhD, Iowa State University.

DOLARIAN, ARA H. (1968), Assistant Professor of Art
BA, MA, San Francisco State College.

DOMINICK, WAYNE P. (1964), Associate Professor of Engineering; Assistant Director of School of Engineering
BSCE, Ohio Northern University; MSCE, ScD, New Mexico State University; Registered Professional Engineer.

DONAGHY, HENRY J. (1971), Lecturer in English
BA, Stonehill College; MA, Fordham University; PhD, New York University.

DONALDSON, JOHN R. (1956), Professor of Physics
BS, MA, Rice University; MS, PhD, Yale University.

DONOHUE, DONALD J. (1965), Associate Professor of Mathematics; Acting Chairman, Mathematics Department
BS, Fresno State College; MS, PhD, University of Oregon.

DOSWALD, HERMAN K. (1967), Associate Professor of Foreign Languages
BA, University of California; MA, PhD, University of Washington.

DOWLER, LLOYD (1948), Professor of Agricultural Education
BS, MS, University of Wyoming.

DOYEL, TOMMY T. (1970), Associate Professor of Finance and Industry
BS, Fresno State College; MBA, PhD, University of California at Los Angeles.

DREW, PATRICIA M. (1969), Associate Professor of Social Work
AB, University of California at Los Angeles; MSW, University of Southern California; DSW, Washington University.

DUKE, JOHN H. (1946), Professor of Journalism; Chairman, Journalism Department.
BJ, University of Texas; MA, PhD, University of Southern California.

DUNNING, WILLIAM J. (1947), Professor of Industrial Arts and Technology
BS, Iowa State Teachers College; MS, Iowa State College; EdD, University of North Dakota.

EBERT, THOMAS J. (1970), Librarian II
BA, MA, MLS, State University of New York.

ECHOLS, JAMES P. (1964), Assistant Professor of History
BA, College of Idaho; MA, University of California.

ECKHARDT, WYMOND W. (1970), Assistant Director of Instructional Media Center; Associate Professor of Elementary Education
BA, George Pepperdine College; MS, EdD, University of Southern California at Los Angeles.

ELGORRIAGA, JOSE A. (1962), Professor of Foreign Languages; Chairman, Foreign Language Department
BA, Fresno State College; MA, PhD, University of California at Los Angeles.

ELHAG-ALI, MOSTAFA (1970), Associate Professor of Accounting and Quantitative Studies
BS, Ain Shams University (Egypt); MBA, PhD, University of Texas.

ELIAS, CLAUDE E., JR. (1969), Dean, School of Business (fall); Professor of Urban and Regional Planning
BA, MA, University of Wyoming; PhD, University of California at Los Angeles.

ELLINGWOOD, JAMES H. (1971), Assistant Professor of Theatre Arts
BA, MA, San Francisco State College.

ELLIS, DAVID L. (1966), Associate Professor of Social Work
BA, University of Oklahoma; MSW, University of California at Los Angeles.

EL SADEK, SAMIR S. M. (1971), Assistant Professor of Industrial Arts and Technology
BS, Cairo University; MArch, University of Oregon.

EMANUEL, EDWARD F. (1969), Assistant Professor of Theatre Arts
BA, MA, San Jose State College.

EMERSON, JOHN T. (1959), Professor of Quantitive Studies
BA, JD, University of Chicago.

EMMAL, MARIE A. (1964), Associate Professor of Social Work
BA, University of California at Los Angeles; Certificate of Mental Health, University of London.

ENSSLIN, WALTER (Spring, 1959), Professor of Foreign Languages
PhD, University of Berlin.

ERB, CHARLOTTE M. (1970), Associate Professor of Management and Marketing
BA, MacMurray College; PhD, University of Wisconsin.

ERVIN, ROGER E. (1957), Professor of Geography
BA, MA, University of Washington; PhD, University of Florida.

ESTES, GENE L. (1964), Associate Professor of Physical Education
BS, MS, University of Oregon; DEd, Colorado State College.

EVANS, ALFRED B., Jr. (1971), Lecturer in Political Science
BA, MA, University of Texas; PhD, University of Wisconsin.

EVANS, RALPH F. (1947), Dean, School of Education; Professor of Education
BEd, Eastern Illinois State Teachers College; MA, PhD, State University of Iowa.

EVANS, RONALD L. (1963), Associate Professor of Biology
BA, MA, University of Toronto; PhD, Stanford University.

EVANS, THOMAS H. (1963), Professor of Engineering
BS, MSCE, California Institute of Technology; Registered Professional Engineer.

EVERWINE, PETER P. (1962), Professor of English
BS, Northwestern University; PhD, State University of Iowa.

EWY, DANIEL J. (1951; 1955), Associate Professor of Mathematics
BA, University of California; MS, Stanford University.

FADERMAN, LILLIAN (1967), Associate Professor of English; Chairman, English Department
BA, University of California; MA, PhD, University of California at Los Angeles.

FALK, DORIS F. (1946-Spring 1972), Professor of Biology
BA, MA, PhD, University of California.

FAST, PETER G. (1957), Professor of Education
BA, Goshen College; MA, Ball State Teachers College; EdD, Indiana University.

FEUCHES, CONRAD (1946), Professor of Industrial Arts and Technology
BA, Fresno State College; MS, Oregon State College.

FEY, RUSSELL C. (1969), Professor of Urban and Regional Planning
AB, Hiram College; MCP, University of California at Berkeley.

FIKES, JAMES A. (1955), Dean of Continuing Education and Summer Sessions; Professor of Health Science
BS, Central State University; MPH, MEd, PhD, University of Oklahoma; Registered Sanitarian.

FIREMAN, JANET R. (1971), Assistant Professor of History
BA, University of Arizona; MA, University of New Mexico.

FISHER, M. BRUCE (1941), Professor of Psychology
BA, University of California; PhD, Yale University; Licensed Psychologist.

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FITCH, JON M. (Spring 1970), Assistant Professor of Communicative Disorders; Chairman, Communicative Disorders Department
BS, Connecticut Teachers College; BLI, Emerson College; MS, Purdue University.

FITZGERALD, EDWARD T. (1969), Assistant Professor of Criminology
BS, MPA, University of Southern California.

FLAKE, LESTER D. (1970), Assistant Professor of Biology
BS, MS, Brigham Young University; PhD, Washington State University.

FLAKE, RHITA (1967), Associate Professor of Physical Education
BS, Brigham Young University; MA, San Jose State College; PhD, University of Southern California.

FLAM, ROBERT A. (1969), Assistant Professor of Office Administration
BS, Valley City State College; ME, University of North Dakota.

FOIN, OWEN F., JR. (1942), Professor of Engineering
BA, Fresno State College; Registered Electrical Engineer.

FORTNER, JACK R. (1970), Assistant Professor of Music
BMus, Aquinas College; MMus, AMusD, University of Michigan.

FOSTER, HAGUE D. (1966), Associate Professor of Philosophy
BA, PhD, University of Chicago.

FOSTON, ARTHUR L. (1968), Professor of Industrial Arts and Technology
BS, BSEE, MS, Prairie View A and M College; MAT, Colorado State University.

FOX, HERBERT S. (1969), Librarian II
BA, Concordia Seminary; BLS, University of British Columbia.

FRANC, MAX B. (1969), Associate Professor of Political Science
BA, St. Norbert College; MA, University of Wisconsin; MPA, PhD, New York University.

FRANCIS, RICHARD W. (1965), Associate Professor of Physical Education
BA, San Jose State College; MA, Fresno State College.

FRANK, DAVID L. (1970), Assistant Professor of Chemistry
BA, Alfred University; PhD, University of Rochester.

FRANKLIN, SAMUEL S. (1969), Associate Professor of Psychology
BA, University of California at Los Angeles; MA, University of California at Santa Barbara; PhD, University of Kansas.

FREEMAN, G. RONALD (1969), Assistant Professor of Foreign Languages
BA, University of Utah; MA, PhD, University of Washington.

FREIJ, ROSALIE L. (Spring 1969), Field Instructor in Social Work (AgSH)
MSW, University of Minnesota.

FREY, JAMES E. (1969), Assistant Professor of English
BA, Jamestown College; MA, Columbia University; PhD, University of California at Berkeley.

FRICKER, HENRY F. (1952), Professor of Health Science and Education; Chairman, Health Science Department; Assistant to the Dean of Continuing Education and Summer Sessions
BA, Marshall College; MA, EdD, Stanford University.

FROM, BENDT A. (Spring 1968), Associate Professor of Agricultural Industry and Education
BA, MEd, University of California at Davis.

FULKERSON, WILLIAM M., JR. (1966), Assistant to the President for Campus Affairs; Associate Professor of Speech Communication
BA, William Jewell College; MA, Temple University; PhD, Michigan State University.

FUTRELL, MAX D. (1970), Assistant Professor of Criminology
BS, MS, Fresno State College.

GADE, WARREN E. (1966), Assistant Professor of History
BS, University of San Francisco; MA, PhD, Stanford University.

GAINES, CHARLES F. (1968), Assistant Professor of Art
BA, Jersey City State College; MFA, Rochester Institute of Technology.

GAISER, EDWARD A. (1969), Assistant Professor of Industrial Arts and Technology
BS, MS, State University College at Buffalo.

GAMMON, EDWARD R. (1966), Associate Professor of Linguistics; Chairman, Linguistics Department
BA, Reed College; MA, University of Oregon; PhD, Stanford University.

GARCIA, MANUEL R., (1969) Assistant Professor of Industrial Arts and Technology
BA, MA, Fresno State College.

GARDNER, FANNIE L. (1959), Professor of Nursing
BS, MEd, University of Houston; Registered Nurse.

GAUSS, NORMAN M. (1968), Assistant Professor of Geography
BA, MA, University of California at Los Angeles.

GENDRON, MAURICE C. (1969), Assistant Professor of Foreign Languages
BA, MA, PhD, University of California at Los Angeles.

GHERARDINI, GARY L. (1970), Assistant Professor of Biology
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GIBSON, GEOFFREY J. (1969), Assistant Professor of Philosophy
BA, City College of New York; MA, Princeton University

GIGLIOTTI, HELEN J. (1966), Associate Professor of Chemistry
BA, Vassar College; PhD, University of Michigan.

GILBERT, STEVEN E. (1970), Assistant Professor of Music
BA, City University of New York; MusM, MPhil, PhD, Yale University.

GILBERT, WILLIAM R. (1955), Professor of Education
BS, BS, MS, University of Illinois; PhD, University of Washington.

GILL, JUNE M. (1971), Assistant Professor of Foreign Language
BA, MA, PhD, University of California at Berkeley.

GILLIS, ALBERT (1969), Professor of Music
BA, MA, Yale University.

GLEASON, KENNETH C. (1946), Professor of Physical Education
BA, Fresno State College; MS, University of Southern California.

GLIM, ROBERT J. (1948), Professor of Animal Sciences and Farm Management
BS, MEd, University of California at Davis.

GOISHI, FRANK H. (1966–1967; 1970) Building Coordinator
BA, MA, Fresno State College; EdD, University of Missouri.

GOLDBLOOM, DAVID E. (1968), Assistant Professor of Home Economics
BA, Trinity College; MA, Cambridge University (England); PhD, University of California.

GONSER, MARTIN E. (1958), Professor of Industrial Arts and Technology
BS, MS, Kansas State College of Pittsburg.

GOODWIN, H. MARSHALL, JR. (1964), Associate Professor of History
BA, MA, San Diego State College; PhD, University of California.

GORMAN, PATRICK C. (1971), Director of Student Activities
BA, MA, University of New Mexico.

GOSLINGA, MARIAN (1969), Librarian II
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GOTHE, A. GERALD (Spring 1965), Librarian III
BA, University of California at Santa Barbara; MLS, University of California.

GOTLIFFE, HARVEY L. (1971), Assistant Professor of Journalism
BS, Wayne State University; MS, San Jose State College.

GRAHAM, GAYLORD O. (1957), Associate Professor of Theatre Arts; Chairman, Theatre Arts Department
BA, MA, State University of Iowa.

GRANNIS, GARY E. (1968), Associate Professor of Industrial Arts and Technology
BSE, MA, Northeast Missouri State Teachers College; EdD, Texas A & M University.

GREEN, MARGARET (1969), Field Instructor in Social Work (SBCWD)
MSW, University of California at Los Angeles.

GREENE, ELEANORE R. (1960), Associate Professor of Nursing
BA, Cornell University; MA, Columbia University; Registered Nurse.

GREGG, CHARLES E. (1969), Assistant Professor of Sociology
JD, University of San Francisco; PhD, University of Utah.

GREGORY, EDDIE J. (1969), Associate Professor of Physical Education
BS, Pepperdine College; MS, University of Southern California.

GRIFFITHS, I. ACE (1959), Professor of Education
BS, University of Idaho; MS, University of Arizona; EdD, Northern Colorado University; Licensed Psychologist.

GROFF, LINDA J. (1971), Lecturer in Political Science
BA, University of Michigan; MA, MALD, Fletcher School of Law.

GRONEMAN, CHRIS H. (1968), Professor of Industrial Arts and Technology
BS, MS, Kansas State College of Pittsburg; EdD, Pennsylvania State University.

GROSSMAN, JOEL S. (1965), Associate Professor of Psychology
BA, University of Michigan; MS, PhD, Western Reserve University.

GULLICKSON, NORMAN A. (1971), Assistant Professor of Industrial Arts and Technology
BS, MS, Stout State University.

GUMP, BARRY H. (1967), Associate Professor of Chemistry
BS, Ohio University; PhD, University of California at Los Angeles.

GUNN, THOMAS I. (1967), Chairman, Agricultural Economics Department; Professor of Agricultural Economics
BS, Brigham Young University; MS, Utah State University; PhD, Cornell University

GUZMAN, PAULA S. (1967–1968; 1971), Lecturer in Recreation
BA, Fresno State College.

HAAK, HAROLD H. (1971), Vice President for Academic Affairs; Professor of Political Science
BA, MA, University of Wisconsin; PhD, Princeton University.

HAAS, RICHARD (1969), Associate Professor of Biology
BA, MA, PhD, University of California at Los Angeles.

HADDAD, MARIE N. (1964), Associate Professor of Nursing
BS, St. Louis University; MN, University of Washington.

HADSALL, LEO F. (1932), Professor of Biology
BA, MA, Bucknell University; PhD, Cornell University.

HAFFNER, SUSANNE A. (1965), Librarian II
BA, University of Oregon; ML, University of Washington.

HAGEN, JOHN W. (Spring 1969), Associate Professor of Agricultural Economics
BS, MS, North Dakota State College; PhD, Washington State College.

HAGGBLADE, BERLE (1963), Professor of Office Administration; Chairman, Office Administration Department
BA, State College of Iowa; MA, Colorado State College; EdD, University of California at Los Angeles.

HAIMBACH, DAVID (1959), Professor of Education
BSEd, EdM, Temple University; EdD, University of Florida.

HAIRABEDIAN, ARA (1953), Professor of Physical Education
BS, University of Southern California; MEd, Pennsylvania State College; EdD, Stanford University.

HAIRE, PAUL L. (1969), Associate Professor of Social Work
AB, Boston College; MSW, Simmons College.

HALL, ELTON A. (1969), Lecturer in Philosophy
BA, Occidental College; MA, University of California at Santa Barbara.

HAMPTON, ROBERT E. (1956), Professor of Marketing; Assistant Dean, School of Business (fall); Acting Dean, School of Business (spring)
BBA, Golden Gate College; MA, Chico State College; EdD, Stanford University.

HANSEN, JULIA A. (1962), Associate Professor of Nursing
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HANZLICEK, CHARLES G. (1966), Associate Professor of English
BA, University of Minnesota; MFA, University of Iowa.

HARBERTSON, NOAL C. (1971), Assistant Professor of Mathematics
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HARDGRAVE, JOHN G. (1971), Assistant Professor of Health Science
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HARKINS, FRANCES H. (Spring 1967), Assistant Professor of Home Economics
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HARLAN, RONALD J. (1956), Librarian III
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HARMON, WALLACE M. (1965), Associate Professor of Biology
BS, The Colorado College; MS, Syracuse University; PhD, University of California at Los Angeles.

HARRISON, RAYMOND H. (1955), Professor of School Administration
BS, Central State College; MS, Oklahoma State University; EdD, University of Denver.

HARRISON, ROBERT D. (1954), Associate Professor of Agricultural Inspection and Services
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HART, FRANCIS A. (1965), Associate Professor of English
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HARTMAN, ROY A. (1971), Lecturer in Industrial Arts and Technology
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HASLAM, HAROLD B. (1970), Assistant Professor of Mathematics
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HASSON, ALLEN (1966), Associate Professor of Education
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HATMAKER, ROBERT L. (1969), Assistant Professor of Social Work
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HAWBECKER, ALBERT C. (1946), Professor of Biology
BA, Fresno State College; MA, University of California; PhD, Oregon State College.

HAYNES, CHARLES W. (1970), Associate Professor of Engineering
BS, MSc, University of Nebraska; DSc, Carnegie Institute of Technology.

HEARD, JOHN R. (1970), Assistant Professor of Music
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HECKMAN, RICHARD A. (Spring 1970), Assistant Professor of Biology
BS, MS, Wisconsin State University; MS, Idaho State University; PhD, Montana State University

HEFFERIN, ELIZABETH A. (Spring 1972), Lecturer in Nursing
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HEINE, LYMAN H., JR. (1968), Assistant Professor of Political Science
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HENDERSON, WALLACE D. (1958), Associate Professor of Speech Communication
BA, Fresno State College.

HENDRICKSON, MARY R. (1966), Associate Professor of Home Economics
BS, University of Tennessee; MS, Oregon State University.

HENFLING, PHYLLIS B. (1940–1945; 1952), Professor of Education
BA, MA, Fresno State College.

HENNINGS, L. RALPH (1969), Associate Professor of Speech Communication; Chairman, Speech Communication Department
AB, MA, San Diego State College; PhD, University of Oregon.

HENNINGS, PATRICIA L. (1970), Assistant Professor of Home Economics
BA, University of California at Santa Barbara; MS, University of Wyoming.

HENRY, NINA J. (1971), Assistant Professor of Home Economics
BS, Oklahoma College of Liberal Arts; MS, Kansas State University.

HERNANDEZ, ROBERT P. (1971), Assistant Director, Educational Opportunities Program
BA, Fresno State College.

HEWITT, ALLAN A. (1968), Professor of Pomology
BS, MS, University of California at Davis; PhD, University of Maryland.

HICKS, CHRISTY V. (1970), Librarian I
BA, University of California at Santa Barbara; MLS, University of California at Los Angeles.

HIGGINS, FRANCES V. (1958), Professor of Engineering
BS, MS, Indiana State Teachers College; MS, University of Michigan; MS, Case Institute of Technology.

HIGHLANDER, JOHN P. (1966), Television Coordinator; Professor of Radio-Television; Chairman, Radio-Television Department
BA, MA, University of Iowa; PhD, University of Wisconsin.

HILLMAN, STEPHANIE (1958), Librarian V
BA, University of California at Los Angeles; MLS, University of California.

HIMES, JUDITH (1971), Field Instructor in Social Work
BA, Whittier College; MS, Columbia University.

HIXSON, FLOYD M. (1951), Professor of Poultry Science
BS, Oklahoma State University; MS, PhD, Kansas State University.

HOGAN, ANNE B. (1964), Associate Professor of Social Work
BA, Vassar College; MSW, University of Pennsylvania.

HOGAN, HILDA M. (1964), Associate Professor of Nursing
BS, MS, Boston University.

HOLDER, WAYNE B. (1955), Professor of Psychology; Acting Chairman, Psychology Department
BA, MA, New Mexico State University; PhD, University of Missouri.

HOLLAND, ROBERT C. (1970), Lecturer in Secondary Education
BA, Texas A & M College; MDiv, Princeton Theological Seminary; PhD, University of Basel (Switzerland).

HOLMES, DONALD E. (1971), Associate Professor of Physics
BS, University of Oklahoma; MS, San Diego State College; PhD, University of California at Los Angeles.

HOPKINS, JERRY D. (1964), Assistant Professor of Linguistics
BA, Indiana University.

HOPPING, ANN (1963), Librarian III
BA, Fresno State College; MLS, University of California at Los Angeles.

HOTZ, DAVID F. (1964–1965; 1970), Associate Professor of Engineering
AB, PhD, University of California at Berkeley.

HOVERSLAND, ARTHUR S. (Spring 1971), Associate Professor of Animal Science
BS, MS, Montana State College; PhD, Oregon State University.

HOWLAND, RUSSELL S. (1948), Professor of Music
BM, MMus, University of Illinois.

HSU, MARILYN M. (1971), Librarian II
BA, National Taiwan University; MALS, Immaculate Heart College.

HUDSON, DAVID C. (1968), Assistant Professor of History
BA, University of Notre Dame; MA, PhD, Columbia University.

HUFF, ARTHUR E. (1964), Associate Professor of Music
BA, MA, San Jose State College; DMA, University of Arizona.

HUGGINS, JOYCE, M. (Spring 1970), Associate Professor of Education
BA, Colgate Rochester Divinity School; MA, New York University; EdD, Arizona State University.

HUI, CHUN-LING (STAN) (1968), Assistant Professor of Art
BA, MFA, University of Idaho.

HULL, F. LEE (1968), Assistant Professor of Finance and Industry
BS, MS, University of Illinois.

HUNT, MAURICE P. (1948), Professor of Educational Foundations
BS, MA, PhD, Ohio State University.

HUNTER, BROOKE B. (1969), Assistant Professor of Physical Education and Recreation
BA, MA, University of California at Los Angeles.

HURST, ROLLAND WOOD (1968), Associate Professor of Music
BA, Grinnell College; MM, Eastman School of Music; EdD, Columbia University.

HUSSON, EVELYN M. (1968), Associate Professor of Nursing
BA, American International College; MA, Teachers College, Columbia University.

ILG, GEORGE F. (1948), Assistant Dean, School of Agricultural Sciences; Professor of Dairy Industry
BS, University of California; MS, Ohio State University.

INGENTHRON, WILLIAM J. (1969), Associate Professor of Journalism
AB, BJ, MA, PhD, University of Missouri.

IRWIN, PHYLLIS A. (1963), Assistant Academic Vice President; Professor of Music
BS, MEd, University of Houston; EdD, Columbia University.

ISHIMOTO, T. TOM (1968), Associate Professor of Vegetable Crops
BA, MA, Fresno State College; PhD, Oregon State College.

JACOBSEN, ERLAND L. (1959), Librarian III
BA, Stanford University; MLS, University of California.

JARRETT, McRAE (1957), Professor of Engineering
BS in EE, MS, University of Tennessee; Registered Professional Industrial Engineer.

JASUTIS, CORDELIA (1959), Professor of Foreign Languages
Lic-es-Let, University of Paris; MA, PhD, State University of Iowa.

JEN, SHIEN-MIN (1970), Assistant Professor of Anthropology
BA, National Taiwan University (Taiwan); MA, New York University.

JENKINS, JACK T. (1964), Associate Professor of Social Work
BSSW, University of Arkansas; MSSW, University of Tennessee.

JENNE, RICHARD S. (1969), Assistant Professor of Industrial Arts and Technology
BPA, Art Center School; MA, Chico State College.

JENNINGS, CALVIN H. (1968), Assistant Professor of Anthropology
BA, MA, PhD, University of Colorado.

JENSEN, KAREN M. (1970), Assistant Professor of Communicative Disorders
BS, Northern Illinois University; MEd, Smith College.

JENSEN, LYNN A. (1968), Assistant Professor of Quantitative Studies
BSBA, Drake University; MBA, Oregon State University.

JEPSEN, VICTOR L. (1946), Professor of Management
BA, MA, University of Oregon; EdD, Stanford University.

JOHNSON, ALAN H. (1963–1969; Spring 1971), Assistant Professor of Geography
BS, MA, University of Missouri.

JOHNSON, BIRGER L. (1955), Professor of Physical Education
BA, North Dakota State Teachers College; MS, University of Oregon; PhD, University of Southern California.

JOHNSON, GORDON F. (1966), Professor of Education
BS, MS, Oregon College of Education; EdS, Stanford University; EdD, University of Oregon.

JOHNSON, MELVIN W., JR. (1968), Assistant Professor of Radio-Television
BA, University of Minnesota; MS, Brooklyn College of City University of New York.

JOHNSON, RONALD D. (1968), Assistant Professor of Theatre Arts
BA, University of California at Santa Barbara; MA, San Francisco State College.

JOHNSON, SUNNIE A. (1970), Assistant Professor of Physical Education and Recreation
BA, California Western University; MA, Whittier College.

JOHNSTON, GERALD L. (1971), Assistant Professor of Accounting and Quantitative Studies
BS, Arizona State University; MBA, Kent State University.

JONES, DAVID N. (1970), Assistant Professor of History
AB, MA, PhD, University of North Carolina.

JONES, HAROLD D. (1957), Director of Placement
BS, Northern State Teachers College (South Dakota); MEd, University of Colorado; EdD, University of Denver.

JONES, HARRY E. (1957), Assistant to the Executive Vice President
BA, San Diego State College; MA, PhD, Claremont Colleges.

JUDD, FLOYD L. (1967), Associate Professor of Physics
BS, Carroll College; MS, PhD, Iowa State University.

KALLAM, JOHN F. (1962), Professor of Criminology
BA, San Jose State College; MS, Fresno State College.

KALLO, ROBERT M. (1950), Professor of Chemistry
BS, PhD, University of California.

KAPOOR, SUDARSHAN (1967), Professor of Social Work
BA, DAV College (India); MA, Delhi School of Social Work; MSW, PhD, Florida State University.

KARIKKA, KATHERINE J. (1967), Associate Professor of Home Economics
BS, Utah State University; MS, Cornell University.

KARLE, HARRY P. (1962), Professor of Plant Pathology and Viticulture; Chairman, Plant Science Department
BS, Fresno State College; MS, PhD, University of California at Davis.

KARR, HAROLD S. (1966), Professor of English
BA, United College (Winnipeg); MA, PhD, University of Minnesota.

KAUFFMAN, GEORGE B. (1956), Professor of Chemistry
BA, University of Pennsylvania; PhD, University of Florida.

KAUSCH, DONALD E. (1965), Associate Professor of English
BA, Wayne State University; MA, University of Michigan; PhD, Wayne State University.

KAY, JEAN A. (1966), Associate Professor of Nursing
Nursing Diploma, Presbyterian Hospital (Philadelphia); SCM, Royal Maternity Hospital (Glasgow); BSPH, MPH, Columbia University.

KENDALL, JOHN C. (1968), Assistant Professor of History
BA, MA, Carleton University; PhD, McGill University.

KENSEL, W. HUDSON (1965), Associate Professor of History
BA, University of Washington; BA, MEd, Central Washington State College; PhD, Washington State University.

KERSHAW, JOYCE (Spring 1967), Associate Professor of Social Work
BA, Fresno State College; MSW, University of California at Los Angeles.

KESSLER, WARREN L. (1968), Associate Professor of Philosophy
BA, Rutgers University; MA, PhD, University of Wisconsin.

KILNER, MICHELE M. (1970), Assistant Professor of Home Economics
BS, MS, University of Arizona.

KIM, JOO I. (1970), Assistant Professor of Agricultural Industry and Education
BSc, Seoul National University (Korea); MSc, Israel Institute of Technology (Israel); PhD, University of British Columbia.

KIMBERLY, MAX E. (1958), Professor of Health Science
BS, MS, Montana State College; MA, EdD, Stanford University.

KINDELL, DOLORES J. (1970), Assistant Professor of Nursing
BSN, University of Rochester; MSN, Marquette University.

KINZEL, PAUL F. (1963), Associate Professor of Foreign Languages
BA, Fresno State College; MA, Columbia University; PhD, University of Washington.

KIPPS, THOMAS C. (1956), Professor of Mathematics
BA, MA, PhD, University of California.

KIRTLEY, DONALD D. (1966), Associate Professor of Psychology
BA, MA, PhD, University of Miami.

KISSICK, ELENA F. (1966), Associate Professor of Home Economics
BS, University of California at Davis; MA, San Jose State College.

KITTREDGE, ROBERT E. (1969), Counselor
BA, State University of New York; MA, PhD, Michigan State University.

KLASSEN, PETER J. (1966), Professor of History; Chairman, History Department
BA, University of British Columbia; MA, PhD, University of Southern California.

KLEEMAN, KARL T. (1971), Assistant Professor of Biology
BS, Purdue University; PhD, Oregon State University.

KNIGHT, PAULINE E. (1968), Associate Professor of Nursing
BS, University of Washington; MA, Teachers College, Columbia University.

KNUDSEN, ROBERT G. (1964), Counselor
BS, MS, Utah State University.

KOCH, GARY M. (1970), Assistant Professor of Plant Science
BS, MS, PhD, Pennsylvania State University.

KOLLER, E. FRANK (1969), Professor of Geography
BA, University of Utah; MA, Brigham Young University; PhD, Pennsylvania State University.

KOLSTAD, WILLIAM A. (1964), Associate Professor of Political Science
BA, Macalester College; LLB, University of Minnesota; MA, University of South Dakota; PhD, University of Texas.

KRAL, IRVIN H. (1969), Faculty Coordinator of Data Processing
BSRE, Indiana Institute of Technology; MSEE, PhD, University of New Mexico.

KRELL, FRED C. (1963), Associate Professor of Nursing
BSN, State University of Iowa; MS, Boston University; Registered Nurse.

KREMEN, BENJAMIN G. (1950), Professor of Education
BS, Johns Hopkins University; MA, University of Maryland; PhD, Michigan State College.

KRUGER, JOHN H., JR. (1964), Professor of Industrial Relations; Chairman, Management and Marketing Department
BMinE, MA, PhD, University of Minnesota.

KULHAN, EDWARD F. (1956), Professor of Engineering
BS, University of Nevada; MS, Pennsylvania State University; Registered Land Surveyor.

KUNIMITSU, DONALD K. (1967), Associate Professor of Chemistry
BA, PhD, University of Hawaii.

KUNIMITSU, VIVIAN Y. (1968–1970; 1971), Assistant Professor of Home Economics
BS, University of Hawaii; MS, Fresno State College.

KUS, JAMES S. (1970), Assistant Professor of Geography
BA, Case Western Reserve University; MA, Michigan State University.

KUSEL, HEINZ N. (1965), Associate Professor of Art
BS, Skidmore College; MA, Fresno State College.

KUTSCHER, ROBERT I. (1970), Assistant Professor of Finance and Industry
AB, Cornell University; JD, Harvard Law School.

LABARRE, ANTHONY E., JR. (1961), Professor of Mathematics
BE, MS, Tulane University; PhD, University of Oklahoma.

LANE, PHILIP J. (1969), Associate Professor of Radio-Television
BA, University of Portland; MA, University of Kansas; PhD, Northwestern University.

LANGE, IAN M. (Spring 1968), Associate Professor of Geology
BA, MA, Dartmouth College; PhD, University of Washington.

LANGE, PAUL M. (1968), Associate Professor of Business Law
BSBA, Northwestern University; MA, Mankato State College; JD, University of Minnesota.

LANGLEY, RONALD J. (1969), Assistant Professor; Instructor, Computer Laboratory
BS, Manchester College; BD, Bethany Seminary; MA, Fresno State College.

LARK, ALEXANDER H. (1968), Assistant Professor of Education; Coordinator, Fresno State College Center for Urban Education
BA, Goshen College; MA, Roosevelt University.

LATIMER, HOWARD L. (1958), Professor of Biology
BS, MS, State College of Washington; PhD, Claremont Colleges.

LAURY, FRANK B. (1959), Associate Professor of Art; Chairman, Art Department (Spring)
BA, University of Northern Iowa; MA, Stanford University.

LEAVITT, GEORGE S. (1955), Professor of Psychology
BA, Macalester College; MA, PhD, University of California.

LEAVITT, JEROME E. (1969), Professor of Education
BS, Newark State College; MA, New York University; EdD, Northwestern University.

LEE, CHUNG MYUN (1970), Lecturer in Geography
BA, MA, Seoul National University (Korea); PhD, University of Michigan.

LEE, DAVID T. (Spring 1971), Associate Professor of Urban and Regional Planning
BS, Taiwan Provincial University (Taiwan); MS, South Dakota State University.

LEE, ROBERT E. (1964), Associate Professor of Geography
BA, MA, San Jose State College; PhD, University of California at Los Angeles.

LESLIE, GLENN F. (1958), Professor of Education
BS, Central Missouri State College; MEd, EdD, University of Missouri.

LEVIN, CARL (1942), Director of Business Affairs
BA, Fresno State College.

LEVIN, JOEL M. (1971), Assistant Professor of Urban and Regional Planning
BA, Boston University; MUP, New York University.

LEVINE, PHILIP (1958), Professor of English
BA, MA, Wayne University; MFA, State University of Iowa.

LEWIS, GEORGE M. (1970), Assistant Professor of English
BA, MA, University of Texas.

LEWIS, LETA J. (1963), Professor of Foreign Languages
BA, University of Washington; PhD, University of California at Los Angeles.

LIAO, SAMUEL Y. (1965), Associate Professor of Engineering
BS, University of Chicago; MSEE, University of Idaho.

LIGHT, JAMES F. (1971), Dean, School of Humanities; Professor of English
BA, MA, University of Chicago; PhD, Syracuse University.

LINDAE, DETLEV (1971), Assistant Professor of Mathematics
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LINDEN, MINERVA S. (1970), Librarian II
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LINDQUIST, STANLEY E. (1953), Professor of Psychology
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LINK, STEPHEN A. (1971), Assistant Professor of Aerospace Stuudies
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LISKEY, NATHAN E. (1965), Associate Professor of Health Science
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LIST, EDGAR A. (1961), Professor of Foreign Languages
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LITZINGER, WILLIAM D. (1970–Spring 1972), Professor of Management and Marketing
BS, New York University; MBA, University of Pennsylvania; DBA, University of Southern California.

LIVINGSTON, WILLIAM H. (1966), Associate Professor of Industrial Arts and Technology
BS, ME, University of California; Registered Electrical Engineer.

LOCKWOOD, NORMAN H. (1968), Assistant Professor of Art
BA, University of Washington; MFA, Mills College.

LOGAN, BARRY L. (1961), Professor of English
BA, MA, Syracuse University; PhD, Yale University.

LOMBARD, EDWIN H. (1947), Professor of Theatre Arts
BA, Oberlin College; MA, Columbia University; MA, PhD, Cornell University.

LORENZ, PHILIP M. (1969), Associate Professor of Music

LORING, JANET (1957), Professor of Theatre Arts
BS, Northwestern University; MA, University of Missouri; PhD, State University of Iowa.

LOWERY, CHARLOTTE M. (1964), Librarian III
BSLS, Western Reserve University (Ohio); MA, University of Southern California.

LUND, EDWARD O., JR. (1966), Associate Professor of Art
BS, University of Wisconsin; MFA, Indiana University.

LUNDBERG, JAMES B. (1960), Associate Professor of Education
BS, North Texas State College; MA, Michigan State University.

LYLES, SAMUEL P. (1969), Research Coordinator; Assistant Professor of Physics
BS, Louisiana State University; MS, PhD, University of Oklahoma.

LYON, EARL D. (1938), Professor of English
BA, University of California at Los Angeles; MA, PhD, University of California.

LYWEN, WERNER (1959), Professor of Music
State Academy of Music, Berlin.

MACH, LELAND E. (1958), Professor of Education
BA, Colorado State College of Education; MA, Northwestern University; EdD, College of the Pacific; Licensed Psychologist.

MACK, SEYMOUR (1957), Professor of Geology
BS, College of the City of New York; MS, PhD, Syracuse University.

MACMILLAN, MARGARET W. (Spring 1970), Assistant Professor of Office Administration
BS, MEd, University of Pittsburgh; EdD, University of California at Los Angeles.

MADDEN, HARRISON E. (1956), Professor of Psychology
BS, MA, MA, PhD, University of Kansas, Licensed Psychologist.

MADDEN, HENRY M. (1949), College Librarian
BA, Stanford University; BLS, University of California; MA, PhD, Columbia University.

MAHONEY, RONALD J. (1968), Librarian III
BA, University of the Americas (Mexico City College); MLS, University of California.

MAJORS, KERN T. (1969), Librarian II
BS, MLS, University of California at Berkeley.

MALKANI, MOTI C. (1970), Assistant Professor of Accounting and Quantitative Studies
BSc, Jai Hind College (India); MSc, University of Bombay (India); MS, Fresno State College.

MALLORY, THOMAS E. (1968), Assistant Professor of Biology
BS, University of Redlands; MS, PhD, University of California at Davis.

MANGAN, JERROME (1970), Assistant Professor of Biology
BA, MS, University of Cincinnati; PhD, Brown University.

MARGOSIAN, ARTHUR H. (1956; 1961), Dean, School of Professional Studies; Professor of Journalism
BA, MA, Fresno State College; EdD, University of Southern California.

MARHENKE, RONALD LEE (1970), Assistant Professor of Chemistry
BS, Valparaiso University; PhD, Purdue University.

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MARKHAM, CHARLES G. (1967), Associate Professor of Geography
BA, University of California at Los Angeles; MA, Colorado State College; PhD, University of California.

MARLOWE, JULIUS H. (1971), Assistant Professor of Sociology
BA, California State College at Long Beach; MA, University of Washington.

MARSTERS, CHARLES R. (1969), Assistant Professor of Aerospace Studies
BS, University of Utah; BA, Willamette University.

MARTIN, HOWARD J. (1965), Associate Professor of Agricultural Industry and Education
BSAE, California State Polytechnic College.

MARTIN, JOHN E. (1959), Professor of Education
BA, Central State College (Oklahoma); MEd, EdD, University of Oklahoma.

MARTIN, JOHN H. (1962), Professor of Music
BS, MA, Ohio State University; EdD, University of Arizona.

MARTINEZ, ERNEST A. (1971), Lecturer in La Raza Studies
BA, MA, Fresno State College.

MAS, JOSE L. (1971), Lecturer in Foreign Languages
BLS, Coegio De La Salle; BA, MA, University of California at Los Angeles.

MASON, R. ELAINE (1956), Professor of Physical Education
BA, Fresno State College; MA, Stanford University.

MATHESON, VERNILE (1970), Director of Financial Aids
BS, Southern Utah State College; MA, Northern Arizona University.

MATTHEW, VIRGIL L., JR. (1948), Professor of History
BA, Fresno State College; MA, PhD, University of California at Los Angeles.

MAUGHELLI, MARY L. (1962), Associate Professor of Art
BA, MA, University of California.

McCLINTIC, J. ROBERT (1954), Professor of Biology
BA, San Diego State College; PhD, University of California.

McCLINTIC, MARGUERITE A. (Spring 1961–1963; 1969), Assistant Professor of Nursing
BSN, MSN, Wayne University.

McCOMAS, WAYNE L. (1953), Professor of Industrial Arts and Technology
BA, Santa Barbara College; MA, Stanford University.

McCONNELL, VANCE Y. (1966), Associate Professor of Foreign Languages
BA, University of Omaha; MA, PhD, University of Arizona.

McDERMOTT, JOHN J. (1969), Assistant Academic Vice President; Associate Professor of English
BA, University of Notre Dame; MA, Columbia University; PhD, University of California at Los Angeles.

McDOUGALL, THOMAS (1966), Assistant Profesor of Art
BA, San Jose State College; MA, San Fernando Valley State College.

McFERRIN, WILLIAM D. (1970), Assistant Professor of Accounting and Quantitative Studies
BS, Northwestern State College; MBA, Louisiana State University.

McGOLDRICK, BERNARD E. (1969), Associate Professor of Political Science
BA, MA, Fordham University; BD, Woodstock College; MA, Georgetown University; PhD, Graduate School of Georgetown University.

McGUIRE, PAUL J. (1966), Assistant Academic Vice President; Professor of Theatre Arts
BA, MA, San Fernando Valley State College.

McKELL, DAVID S. (1967), Lecturer in Social Welfare
BS, University of Oregon; MSW, University of Utah.

McKERMAN, PATRICIA J. (1970), Lecturer in Biology
BA, University of Northern Iowa; MA, Stanford University.

McKNIGHT, H. RAY (1965), Associate Professor of English
BA, Harvard College; MA, PhD, University of North Carolina.

McLEOD, ALBERT I. (1968), Assistant Professor of Sociology
BA, Evangel College; MA, University of Omaha.

MEAD, RICHARD R. (1968), Professor of Marketing
BA, PhD, University of Pennsylvania.

MEEKER, MURIEL (1950), Lecturer in Elementary Education
BA, San Francisco State College; MA, Fresno State College.

MEINKE, NORMAN D. (1970), Assistant Professor of English
BA, MA, San Francisco State College; MFA, University of Oregon.

MERCHEN, WAYNE V. (1969), Associate Professor of Urban and Regional Planning
BA, Fresno State College; MUP, University of Washington.

MERRIFIELD, ALEANOR R. (1969), Professor of Social Work
BS, University of Oregon; MA, University of Chicago.

MERRILL, ROBERT D. (1970), Assistant Professor of Geology
BA, University of California at Riverside; MS, University of Massachusetts.

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MESCHERIN, EUGENE (1967), Librarian II
MA, University of California at Riverside.

MEYER, RONALD W. (1966), Associate Professor of Botany
BS, MA, University of Missouri; PhD, University of California.

MEYERSON, MARION D. (1971), Lecturer in Communicative Disorders
BA, Hunter College; MA, Brooklyn College; PhD, University of Illinois.

MILLER, HARRY J. (Spring 1970), Assistant Professor of Quantitative Studies
BA, MBA, Fresno State College.

MILLER, JAMES B. (1971), Director of Public Information
BS, Mount San Antonio College.

MILLER, TERRY C. (1969), Assistant Professor of Theatre Arts
AB, University of California at Berkeley; MA, Northwestern University; MFA, Ohio University.

MILLER, WILLIAM M. (1956), Professor of Chemistry
BS, University of Illinois; MS, PhD, State University of Iowa.

MINICH, MARSHALL E. (1966), Associate Professor of Finance and Industry; Director, Bureau of Business Research and Service
BS, Lafayette College; MBA, Harvard Business School.

MINICK, ROBERT A. (1962), Associate Professor of Economics
BS, MS, North Texas State College; PhD, University of Texas.

MINSCHEW, WILLIAM E., JR. (Spring 1963), Associate Professor of Art
BS, Atlantic Christian College; MFA, University of North Carolina.

MISTRY, P. J. (1969), Assistant Professor of Linguistics
BA, MA, Elphinstone College (Bombay); MA, University of Pennsylvania; PhD, University of California at Los Angeles.

MITCHELL, COLLEEN A. (1968), Librarian II
BA, College of the Holy Names; MA, Washington University; MLS, University of California.

MITCHELL, T. RUSSELL (1967), Acting Director of Admissions and Records
BA, MA, Fresno State College.

MIZELL, M. Diann (1970), Assistant Professor of Communicative Disorders
BSE, Henderson State College; MA, University of Houston.

MOERK, ERNEST (1967), Associate Professor of Psychology
MA, PhD, University of Innsbruck.

MOHAMED, FARIDA O. (1969), Assistant Professor of Physical Education and Recreation
MA, Wyoming University; PhD, University of Southern California.

MOLEN, DAYLE, H. (1963), Associate Professor of Journalism
BA, University of Idaho; MS, University of Oregon.

MONKE, ROBERT H. (1969), Associate Professor of Education
BS, MS, Illinois State University; PhD, Arizona State University.

MONSON, WILLIAM N. (1968), Assistant Professor of Radio-Television
BA, Knox College; MA, San Fernando Valley State College.

MONTGOMERY, RICHARD C. (1966), Professor of Geography; Chairman, Geography Department
BS, University of Idaho; MA, PhD, University of Nebraska.

MOODY, RALPH L. (1970), Assistant to the Dean of Continuing Education and Summer Sessions
BS, University of Kansas; MS, Canisius College.

MOORE, BARBARA M. (1969), Associate Professor of Social Work
BA, Mount Holyoke College; MSW, University of Pennsylvania.

MOORE, HEYWARD, JR. (1965), Associate Professor of Political Science
BA, University of North Carolina; MA, University of Florida; PhD, University of North Carolina.

MORGAN, DONALD L. (Spring 1972), Assistant Professor of Geography
BA, MA, University of California at Los Angeles; MS, Stanford University; PhD, University of California at Davis.

MORI, NOBUO (1967), Associate Professor of Social Work
BS, MSW, University of Utah.

MORTIMER, DELL L. (1968), Professor of Accounting
BA, Chico State College; MBA, University of California; DBA, University of Colorado.

MOSHER, DIANE L. (1968), Librarian II
BA, Fresno State College; MLS, University of California at Los Angeles.

MOSKOWITZ, MARK R. (1970), Lecturer in English
BA, Dickinson College; MA, Stanford University.

MOSS, STANLEY S. (1965), Associate Professor of Social Work
BSS, College of City of New York; MSW, Rutgers, The State University.

MOTT, MARY L. (1969), Associate Professor of Physical Education and Recreation
BA, University of California at Santa Barbara; MA, Stanford University; PhD, Louisiana State University.

MOUNDAY, LYNNE H. (Spring 1971), Lecturer in Anthropology
AB, MA, University of California at Davis.

MOYLE, PETER B. (1969), Assistant Professor of Biology
BA, University of Minnesota; MS, Cornell University; PhD, University of Minnesota.

MULDER, ROBERT L. (1971), Lecturer in Communicative Disorders
BA, Western Michigan University; MA, PhD, Ohio State University.

MULLEN, WILLIAM P. (1969), Assistant Professor of Music
BM, MM, University of Illinois.

MULLENNIX, GRADY L. (1958), Professor of Economics
BS, MS, North Texas State College; PhD, University of Texas.

MUSSELMAN, DARWIN B (1953), Professor of Industrial Arts and Technology
BA, Fresno State College; MFA, California College of Arts and Crafts; MA, University of California.

NAGY, ELEMER J. (1960–1961; 1962), Professor of Foreign Languages
MA, PhD, P. Pazmany University (Budapest).

NALBANDIAN, LOUISE (Spring 1964), Associate Professor of History
BA, San Francisco State College; MA, PhD, Stanford University.

NASSE, GEORGE N. (1965), Professor of Geography
BA, Clark University; MA, PhD, University of Michigan.

NATHARIUS, DAVID T. (1966), Assistant Professor of Speech Communication
BA, Los Angeles State College; MA, Bradley University.

NELSEN, CLAIR E. (1950; 1955), Professor of History
BA, Fresno State College; MA, PhD, Stanford University.

NELSON, DARREN M. (1968), Professor of Animal Sciences
BS, University of Nebraska; PhD, University of Illinois.

NELSON, DONALD D. (Spring 1964), Associate Professor of Animal Sciences
BS, Fresno State College; MS, University of California at Davis; PhD, Ohio State University.

NELSON, MYRTHEL S. (1965), Associate Professor of Nursing
BA, College of Great Halls; MA, Gallaudet College; MA, Columbia University; MN, Yale University.

NEWCOMB, RICHARD F. (Spring 1956), Professor of Industrial Arts and Technology
BA, MA, Fresno State College.

NEWELL, TERRY G. (1969), Assistant Professor of Psychology
BA, PhD, University of Minnesota.

NEWSOME, RATANA (1961), Professor of Home Economics
BA, Chulalongkorn University (Thailand); MS, PhD, Florida State University.

NICKLETT, GEORGIA E. (1965), Associate Professor of Education
BA, University of California at Los Angeles; MA, EdD, Columbia University.

NIGGLE, CHRISTOPHER J. (1970), Assistant Professor of Economics
BA, Arizona State University; MA, New School for Social Research.

NISHIO, KAREN H. (1959; 1963), Professor of Nursing
BS, University of Dayton; MS, University of California at Los Angeles; Registered Nurse.

NIXON, ARNE J. (1961), Professor of Education; Chairman, Elementary Education Department
BS, Ellendale State Teachers College (North Dakota); EdM, Western Washington College of Education; EdD, Teachers College, Columbia University.

NOKLEBERG, WARREN J. (1970), Assistant Professor of Geology
BA, University of California at Los Angeles; PhD, University of California at Santa Barbara.

NORSWORTHY, STANLEY F. (1966), Associate Professor of Geography
BA, University of California at Los Angeles; MA, Miami University; PhD, University of California at Los Angeles.

NORTON, RICHARD (1963), Assistant Professor of Enology; Chairman, Agricultural Industry and Education Department
BA, Fresno State College.

NUNEZ, THOMAS D. (1970), Assistant Professor of Social Welfare and Ethnic Studies
BS, MSW, Fresno State College.

NUR, HUSSAIN SAYID (1967), Associate Professor of Mathematics
BS, University of Bagdad; MA, PhD, University of California.

NURY, FREDOON S. (1969), Professor of Food Science
BS, University of California at Berkeley; MS, American University; PhD, Utah State University.

NWOKO, SOMAYINA G. (1968), Associate Professor of Agricultural Economics
BS, University of Ibadan (Nigeria); MS, PhD, University of California at Davis.

O'BRIEN, JOHN C. (1965), Professor of Industrial Economics
BCom, University of London; MA, PhD, University of Notre Dame.

OGDEN, LOWELL K. (1958), Assistant Professor of Elementary Education
BS, Arkansas State Teachers College; MA, University of Wyoming; EdD, University of Southern California.

OLNEY, ARTHUR J. (Spring 1969), Associate Professor of Ornamental Horticulture
BS, University of Rhode Island; MS, PhD, Michigan State University.

O'NEIL, ROBERT M. (1957), Professor of English
BA, MA, Montana State University; PhD, University of Washington.

OPPER, S. MICHAEL (1965), Associate Professor of Art
BS, Southern Connecticut State College; MA, Columbia University; PhD, Institute of Asian Studies.

OSTERBERG, RICHARD F. (Spring 1971), Lecturer in Elementary Education
BA, MA, Fresno State College.

OVERSTREET, LEILANI (1970), Assistant Professor of Physical Education and Recreation
BA, MA, San Fernando Valley State College.

OWENSBY, LOLA B. (Spring 1963; 1970), Assistant Professor of Physical Education and Recreation
AB, Fresno State College; MS, University of Wisconsin.

PADILLA, ROBERT, JR. (1969), Coach, Physical Education
BA, Fresno State College; MA, Northern Arizona University.

PAGLIERANI, GARY B. (1970), Assistant Professor of Industrial Arts and Technology
BA, MA, San Jose State College.

PALOMINO, ERNEST (1970), Assistant Professor of La Raza Studies
BA, Fresno State College; MA, San Francisco State College.

PANGULULA, BERNARD M. (1970), Lecturer in Ethnic Studies
BS, MBA, Fresno State College.

PANICO, VICTOR G. (1970), Assistant Professor of Office Administration
BS, MS, Siena College; EdD, Arizona State University.

PANTER, DWIGHT E. (1970), Lecturer in Industrial Arts and Technology
BA, Fresno State College.

PAPE, LAURENCE A. (1951), Professor of Physical Education
BA, MA, Ohio State University; EdD, Columbia University.

PARKER, LILLIE A. (1951), Librarian V
BA, BLS, University of California.

PARKER, WILLIAM M. (1950), Professor of Accounting
BS, MBA, University of California; PhD, University of Southern California; Certified Public Accountant.

PATTERSON, MARY G. (1969), Professor of Nursing; Chairman, Nursing Department
BS, PHN, Columbia University; MS, New York University; EdD, University of California at Los Angeles.

PAUL, MARTIN T. (1967), Associate Professor of English
BA, College of the Holy Cross; MA, PhD, University of Wisconsin.

PENGILLY, ROBERT W. (1970), Lecturer in Secondary Education
BS, University of Minnesota; MNS, Arizona State University.

PEREZ, MANUEL (1971), Director of Educational Opportunity Program; Lecturer
BA, MSW, Fresno State College.

PEREZ, TERESA R. (1971), Lecturer in La Raza Studies
BA, Fresno State College.

PETESCH, WILLIAM J. (1968), Librarian II
BA, MA, University of Montana; MALS, University of California.

PETRUCCI, VINCENT E. (1948), Professor of Viticulture
BS, MS, University of California at Davis.

PFLUEGER, CLAYTON C. (1959), Associate Professor of Dairy Industry
BS, South Dakota State College; MS, State College of Washington.

PICKEL, DONNA RAE (1967), Assistant Professor of Physical Education
BS, Oklahoma Baptist University; MS, Smith College.

PICKERING, JEAN E. (1970), Assistant Professor of English
BA, University College (London University); MA, San Francisco State College.

PICKFORD, PATRICIA R. (Spring 1957), Professor of Social Work
BA, Fresno State College; MSW, University of California at Los Angeles.

PIERSOL, ROBERT J. (1968), Professor of Marketing
BSME, University of Illinois; MBA, Stanford University; DBA, Harvard University.

PIGG, C. JOANNE (1964), Professor of Biology
BA, Arizona State University; MS, PhD, Oregon State University.

PINCU, LESTER P. (1970), Associate Professor of Criminology
BS, Tufts University; MA, University of California at Berkeley.

PIROFALO, LEON C. (1970), Lecturer in Urban and Regional Planning
BArch, Illinois Institute of Technology.

PISCIOTTOLI, LOUIS F. (1967), Assistant Professor of Economics
BA, Boston College; PhD, Duke University.

PITT, JACK A. (1957), Professor of Philosophy
BS, Sir George Williams College (Canada); BA, MA, McGill University (Canada); PhD, Yale University.

POOLE, PATRICK H. (1966), Counselor
BA, University of Tulsa; MS, Kansas State College. Licensed Marriage Counselor; Licensed Psychometrist.

POSEY, CLYDE L. (1966), Assistant Professor of Accounting and Quantitative Studies
BBA, Texas Western College; MBA, University of Texas; CPA, California, Texas.

POSS, STANLEY H. (1956), Professor of English
BA, University of Redlands; MA, Claremont Graduate School; PhD, University of Washington.

POSTON, BILLIE L. (1966), Assistant Professor of Physical Education
BS, MS, University of Tennessee.

POWELL, FRANK V. (1955), Professor of Psychology
BA, University of Redlands; MS, PhD, University of Wisconsin; Licensed Psychologist.

POYTHRESS, RANSOM H. (Spring 1962), Associate Professor of Foreign Languages
BA, Stanford University; MA, Fresno State College.

PREDIKA, RAE A. (1969), Assistant Professor of Physical Education and Recreation
BS, Bowling Green State University; MS, Akron University.

PRONIN, ALEXANDER (1965), Associate Professor of Foreign Languages
BA, University of California; PhD, Georgetown University.

PROVOST, DAVID H. (1958), Professor of Political Science
BA, Pomona College; PhD, University of Queensland (Australia).

QUADRO, DAVID F. (1970), Assistant Professor of Speech Communication
BA, University of the Pacific; MA, San Fernando Valley State College.

QUINN, JOHN R. (1969), Associate Professor of Criminology
BA, Aquinas College; MA, Michigan State University.

QUIRK, WILLIAM M. (1969), Assistant Professor of Education
BS, Kansas State College of Pittsburg; MS, Fort Hays Kansas State College.

RABAGO, EMPERATRIZ N. (1971), Associate Professor of Nursing
BSE, University of Santo Thomás Library; MA, Northwestern University; MNE, PhD, Indiana University.

RANDALL, CHARLES H. (1962), Associate Professor of Theatre Arts
BA, Central Washington College of Education; MFA, Yale University.

RANEY, GEORGE W. (1969), Assistant Professor of Linguistics
BA, Loyola University; MA, PhD, University of Southern California.

RAY, D. N. (Spring 1969), Professor of Criminology
BA, Yankton College; MA, Washington State University.

REA, RALPH C. (1954), Professor of Music
BM, Eastman School of Music; MA, PhD, State University of Iowa.

REA, THELMA M. (1958), Professor of Education
BS, MS, University of Idaho; EdD, Stanford University.

READ, WALTER (1969), Assistant Professor of Mathematics
BA, Pennsylvania State University.

REBEIZ, CONSTANTIN A. (1971), Lecturer in Biology
BS, American University of Beirut; MS, PhD, University of California at Davis.

REEDER, CHARLOTTE P. (1968), Assistant Professor of Economics
BA, MA, University of Illinois.

REES, BRYANT E. (1947), Professor of Biology
BA, MA, University of Utah; PhD, Stanford University.

REHART, B. SCHYLER, JR. (Spring 1963), Associate Professor of Journalism
BA, MA, Fresno State College.

REICHART, RAPHAEL X. (1971), Assistant Professor of Art
BA, San Diego State College; MA, University of California at Los Angeles.

REIGHARD, EDWARD (Spring 1960), Professor of Management
BA, Middlebury College; BD, Yale University; MBA, PhD, Stanford University.

REITMAN, SANDFORD W. (1966), Associate Professor of Education
BA, Ohio University; MA, EdD, Western Reserve University.

RENZI, DOROTHY (Spring 1968), Associate Professor of Music
BA, Mills College.

REYNOLDS, DANIEL LEE (1968), Assistant Professor of Management
BS, Millikin University; MS, University of Illinois.

RICE, WILLIAM C. (1970), Assistant Professor of Home Economics
MS, Pennsylvania State University; BS, PhD, Brigham Young University.

RICH, WALLACE N. (1963), Professor of Social Work
BA, Fresno State College; MSW, Florida State University.

RICHARDS, HERBERT D. (1955), Professor of Engineering
BS, University of California; MS, Stanford University; Registered Civil and Structural Engineer.

RICHTER, BERTINA (1967), Librarian II
BA, Sacramento State College; MLS, University of California.

RIES, JOACHIM S. (1964), Associate Professor of English
BA, Syracuse University; MA, PhD, University of Washington.

RIGGINS, LESTER (1971), Assistant Professor of Ethnic Studies; Coordinator of Black Studies
BA, Fresno State College; MBA, Indiana University; MA, Federal City College.

RILEY, DENNIS D. (1971), Lecturer in Music
BM, University of Colorado; MM, University of Illinois.

RIPPEY, ANDREW D. (1946), Professor of Education
BS, MA, University of Florida; PhD, Ohio State University.

RITENOUR, GARY L. (1969), Associate Professor of Agronomy
BS, Purdue University; MS, PhD, University of California at Davis.

ROBERTS, HENRY L. (1952), College Fiscal Officer
BA, Occidental College.

ROCKWELL, JAMES H. (1957), Professor of Industrial Arts and Technology
BS, Stout Institute; MS, Bradley University.

RODEMEYER, STEPHEN A. (1967), Associate Professor of Chemistry; Chairman, Chemistry Department
BS, St. Thomas College; PhD, University of California.

ROGERS, DARRYL D. (Spring 1966), Professor of Physical Education
BA, University of Denver; MA, Fresno State College.

ROMERO, RUTH M. (1969), Assistant Professor of Linguistics
BA, Smith College; MA, Radcliffe College.

ROSE, CARLENE (1951), Professor of Home Economics; Chairman, Home Economics Department
BS, University of Minnesota; MS, Oregon State College.

ROSENTHAL, JUDY A. (1971), Assistant Professor of English
BA, Harpur College; BA, PhD, University of Pittsburgh.

ROSS, DAVID A. (1968), Assistant Professor of Foreign Language
BA, MA, University of California at Los Angeles.

ROSS, T. EDWARD (1971), Librarian II
BA, University of California; BLS, University of Toronto.

ROTH, HOWARD C. (1967), Associate Professor of Foreign Languages
BA, Fresno State College; MA, University of California; PhD, University of Washington.

ROTH, LESTER J. (1956), Professor of Social Science and Education
BS, Kent State University; MA, Western Reserve University; EdD, Stanford University.

ROTSTAN, JOHN A. (1967), Associate Professor of Political Science; Chairman, Political Science Department
BA, MEd, Whittier College; MA, PhD, Claremont Graduate School.

ROUSEK, EDWIN J. (1948), Professor of Animal Sciences
BS, University of Nebraska; MS, Cornell University.

ROWE, IVAN H. (1969), Assistant Professor of Education
BA, MA, University of Auckland; MA, Fresno State College; DipEd, University of Auckland.

ROWLAND, WALTER F. (1967), Associate Professor of Engineering; Director of Atmospheric Water Resources Research
BS, MS, University of Illinois; PhD, Stanford University, Registered Civil Engineer.

RUHL, ERVING C. (1967), Associate Professor of Social Work
BA, Monmouth College; MA, University of Chicago.

RUIZ, ERNESTO A. (1971), Assistant Professor of History
MA, Saint Louis University.

RUSSELL, KENNETH H. (1963), Associate Professor of Chemistry
BS, Portland State College; PhD, Washington State University.

RYAN, ROBERT P. (1970), Assistant Professor of Theatre Arts
BA, MA, San Jose State College.

SAAKE, ROBERT D. (1969), Associate Professor of Criminology
BA, San Francisco State College; MS, Sacramento State College.

SADDLER, JAMES K. (1970), Assistant Professor of Foreign Language
AB, MA, University of California at Los Angeles.

SALANDINI, VICTOR P. (Spring 1971), Lecturer in La Raza Studies
MA, St. Louis University; PhD, Catholic University of America.

SANFORD, ROBERT (1970), Assistant Director of Financial Aids
BS, Union College; JD, Boston University School of Law.

SANTIGIAN, M. MARTY (Spring 1970), Professor of Education
BA, Occidental College; MA, Fresno State College; EdD, University of California at Berkeley.

SARAGOZA, ALEXANDER M. (1971), Assistant Professor of La Raza Studies; Coordinator of La Raza Studies
BA, Fresno State College; MA, Harvard University.

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SAUER, KEITH (1971), Assistant Professor of Foreign Language
BA, MA, University of California at Berkeley; PhD, University of Washington.

SAWYER, DANIEL B. (1968), Associate Professor of Physical Education and Recreation
BA, San Jose State College; MS, Los Angeles State College; PhD, University of Southern California.

SCHMITZ, CAROLYN A. (1969), Assistant Professor of Nursing
BSN, University of Indiana; MS, Boston University.

SCHORLING, HORACE O. (1941), Executive Vice President; Professor of Industrial Arts and Technology
BA, San Jose State College; MS, EdD, Oregon State College.

SCHRAMM, DWAYNE G. (1967), Associate Professor of Office Administration
BA, State College of Iowa; MA, Colorado State College; PhD, University of California at Los Angeles.

SCHROEDER, JOAN G. (1970), Associate Professor of Accounting and Quantitative Studies
BS, Marquette University; MBA, PhD, University of Wisconsin.

SCHROETER, FRANK E. (1949), Professor of Industrial Arts and Technology; Chairman, Industrial Arts and Technology Department
BS, MS, Stout Institute.

SCHROLL, JOANNE W. (1963), Associate Professor of Physical Education
BA, MA, Fresno State College.

SCHWARTZ, MARVYN S. (1958), Director of Health Services
BA, Fresno State College; MD, University of California.

SCOTT, FREDERIC A. (1957), Professor of Physics
BS, New York State College; MS, Lehigh University; PhD, Rice University.

SEIB, KENNETH A. (1968), Associate Professor of English
BA, Ashland College; MA, Columbia University; PhD, University of Pittsburg.

SELKIRK, ROBERT J., JR. (1948), Professor of Dairy Science
BS, MEd, University of California at Davis.

SHACKLETT, ROBERT L. (1949; 1955), Assistant Dean, School of Graduate Studies; Professor of Physics
BA, Fresno State College; PhD, California Institute of Technology.

SHANAB, MITRI E. (1968), Associate Professor of Psychology
BA, San Francisco State College; PhD, University of California at Santa Barbara.

SHANKS, SUSAN J. (1970), Assistant Professor of Communicative Disorders
BEd, University of Toledo; MA, Bowling Green State University; PhD, Louisiana State University.

SHAW, JOHN A., JR. (1965), Associate Professor of Economics
BA, San Diego State College; MS, PhD, Purdue University.

SHELTON, ERNIE G. (1971), Assistant Director, Educational Opportunity Program; Lecturer
BA, Stanislaus State College.

SHEPARD, BERNARD A. (1948), Professor of Journalism
BA, Union College; BS, Columbia University; MS, PhD, Syracuse University.

SHETZLINE, MARY B. (1970), Assistant Professor of English
BA, Barnard College; MFA, University of Oregon.

SHOCKLEY, JAMES T. (1951; 1956), Professor of Physics
BA, MA, Fresno State College; PhD, University of Southern California.

SHORE, SHARON K. (1970), Assistant Professor of Art
BFA, Illinois Wesleyan University; MS, University of Oregon.

SIA, MING BE (1964), Associate Professor of Nursing
BA, Hwa Nan College (China); MA, Teachers College, Columbia University.

SIEVE, KENNETH J. (1970), Assistant Professor of Geography
BS, MA, University of Missouri.

SIGALA, RALPH (1969), Counselor
BA, MA, Eastern New Mexico University.

SIMIS, PETER (1970), Assistant Professor of Accounting and Quantitative Studies
BS, MBA, Fresno State College.

SIMMONS, ANDREW M. (1970), Assistant Professor of English
BA, MA, University of Missouri.

SIMPSON, DOUGLAS B. (1971), Associate Professor of Management and Marketing
BC, University of British Columbia; MBA, University of California at Berkeley; PhD, University of Washington.

SIMPSON, ELIZABETH P. (1965), Associate Professor of Elementary Education
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SKEI, ALLEN B. (1970), Associate Professor of Music
BA, St. Olaf College; MMus, PhD, University of Michigan.

SLANICEANU, ADRIANA N. (1969), Assistant Professor of Foreign Languages
BA, University of Alberta; MA, University of Washington.

SLINGER, JAMES W. (1969), Assistant Professor of Philosophy
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SLOAN, FORREST E. (1954), Professor of Elementary Education
BS, Illinois State University; MA, EdD, Northern Colorado University.

SMALLEY, R. GAYLE (1963), Associate Professor of Art
BFA, Rochester Institute of Technology; MFA, Indiana University.

SMARDAN, LAURENCE E. (1966), Professor of Home Economics
BA, MS, University of Southern California; PhD, Cornell University.

SMETHERMAN, ROBERT M. (1967), Associate Professor of History
BA, Claremont Men's College; MA, Los Angeles State College; PhD, Claremont Graduate School.

SMITH, CHARLENE K. (1960), Professor of Education
BA, Western College (Ohio); MS, Butler University; EdD, Colorado State College.

SMITH, EPHRAIM K., JR. (1966), Assistant Professor of History
BA, Hillsdale College; MA, University of Nebraska; PhD, Johns Hopkins University.

SMITH, JAMES H. (1955), Director, Division of Engineering; Professor of Engineering
EE, MS, University of Cincinnati; BA, BS, PhD, University of Illinois; Registered Electrical Engineer.

SMITH, JAMES MARVIN (1959–1966; 1969), Professor of Philosophy; Chairman, Philosophy Department
BA, University of Southern California; MA, PhD, Brown University.

SMITH, JAMES MITCHELL (1965), Associate Professor of Psychology
BA, PhD, University of California at Los Angeles.

SMITH, LAWRENCE E. (1967), Associate Professor of Industrial Arts and Technology
BS, MS, Stout State University.

SMITH, PHILIP N. (1958), Professor of Biology
BA, PhD, University of California.

SMITH, R. WAYNE (Spring 1971), Assistant Professor of Theatre Arts
BS, Pennsylvania State University; MA, Columbia University; PhD, Bowling Green State University.

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BA, Sacramento State College; MLS, University of California.

SOBOLIK, GAYLE A. (1969), Associate Professor of Office Administration
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SPARKS, RICHARD K. (1961), Professor of Education
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SPIELER, RICHARD A. (1968), Associate Professor of Biology
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STAEBLER, ARTHUR E. (1955), Professor of Biology
BS, MS, PhD, University of Michigan.

STANDING, KEITH M. (1958), Professor of Biology; Chairman, Biology Department
BS, MS, Brigham Young University; PhD, Washington State University.

STANDRING, L. HARRIET (1971), Lecturer in Music
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STRONG, WINSTON C. (1940), Professor of Irrigation
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STRUMWASSER, GINA (1971), Lecturer in Art
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STULL, SARAH L. (1959–1966), Librarian II; (1967), Assistant Professor of Education
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SUN, HUGO S. (1970), Assistant Professor of Mathematics
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SUPERSAD, JANKIE N. (1970), Associate Professor of Engineering
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BA, University of Minnesota; MSW, DSW, University of Southern California.

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TEBOR, IRVING B. (1971), Acting Dean, School of Social Work
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TERRY, EDWIN F. (1969), Associate Professor of Economics
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THOMPSON, ALASTAIR W. (1969), Professor of Aerospace Studies; Chairman, Aerospace Studies Department
BA, Kent State College; MBA, George Washington University; Lt. Col. USAF.

THOMPSON, GENE L. (1965), Assistant Professor of Art
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THOMPSON, SHIRLEY M. (1953), Associate Professor of Physical Education
BS, MS, University of Wisconsin.

THOMSON, PATRICIA L. (1967), Associate Professor of Physical Education; Coordinator of Women's Physical Education
BA, University of Washington; MS, University of California at Los Angeles; PhD, University of Southern California.

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TOCCHIO, OCTAVIO J. (1959), Professor of Criminology; Assistant Dean, School of Professional Studies
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TOKMAKIAN, HAROLD H. (Spring 1968), Professor of Urban and Regional Planning; Chairman, Urban and Regional Planning Department
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VANDER MEER, PAUL (1971), Assistant Professor of Geography
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VAVOULIS, ALEXANDER (1963), Associate Professor of Chemistry
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VIAU, MONNETTE C. (1969), Assistant Professor of Nursing
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VIDOLI, VIVIAN A. (1970), Assistant Professor of Biology
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VISWESWARAN, GANESHA (1969), Associate Professor of Social Work; Chairman, Social Welfare Department
BS, University of Madras (India); DSSA, Madras School of Social Work; MSW, University of Illinois.

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WALKER, HAROLD E. (1965), Professor of Philosophy
BA, Whittier College; BD, Hartford Seminary; PhD, University of Edinburgh.

WALKER, PHILLIP N. (1950), Professor of Theatre Arts; Assistant Dean, School of Professional Studies
BA, MA, University of Washington; PhD, University of Southern California.

WAMPLER, MARVIN B. (1969), Executive Dean
BA, College of Idaho; MA, DEd, Stanford University.

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WARDLE, ORRIN D. (1957), Professor of Education
BS, MS, Utah State College; EdD, University of California.

WARMERDAM, CORNELIUS A. (1947), Professor of Physical Education
BA, Fresno State College; MA, Stanford University.

WARNER, GUY E. (1971), Lecturer in Radio-Television
BA, David Lipscomb College; MA, Central Michigan University.

WARREN, LESLIE V. (1970), Financial Aids Counselor
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WASHBURNE, CHANDLER (1968), Professor of Sociology
BA, MA, PhD, Michigan State University.

WATTS, PHYLLIS W. (1945), Dean, School of Graduate Studies, Professor of English
BA, Santa Barbara State College; MA, Claremont Colleges; EdD, Stanford University.

WAYNE, WILLIAM C. (1954), Professor of Business
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WEITZMAN, RAYMOND S. (1968), Associate Professor of Linguistics
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WELCH, MARIE R. (1969), Associate Professor of Nursing
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WETMORE, CHARLES H. (1970), Associate Professor of Management and Marketing
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WHEELER, KENNETH G. (1971), Assistant Professor of Management and Marketing
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WHITE, STANTON M. (1967), Associate Professor of Geology; Acting Chairman, Geology Department (Fall)
BS, University of Massachusetts; MS, University of Rochester; PhD, University of Washington.

WIGHT, WILMA F. (1940), Professor of Office Administration
BA, MA, Stanford University.

WILCOX, JACK (1968), Assistant Professor of Physical Education
BA, MA, Fresno State College; PhD, University of Utah.

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WILD, ERNEST S. (1948), Professor of Physical Education
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WILEY, FRANCIS A. (1946), Professor of History
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WILKIN, BRUCE M. (1967), Professor of Education
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WILLIAMS, SHERLEY A. (1969), Associate Professor of Ethnic Studies
AB, Fresno State College.

WILLIAMS, WESLEY M. (1961), Professor of Art; Chairman, Art Department (fall)
BA, MA, University of California; EdD, Stanford University.

WILLIAMSON, HUGH A. (1967), Associate Professor of Physics
BA, North Texas State College; PhD, University of Texas.

WILSON, DONALD M. (1956), Professor of Communicative Disorders
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WINEGAR, GARY H. (1969), Assistant Professor of Industrial Arts and Technology
BS, Brigham Young University; MEd, DEd, Texas A&M University.

WINSTON, NANCY J. (1971), Lecturer in Home Economics
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WINTER, JAMES H. (1947), Professor of Music
BA, Carleton College; MMus, Northwestern University; PhD, State University of Iowa.

WOHL, MILTON (1967), Associate Professor of Linguistics
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WOO, NORMAN T. (1968), Associate Professor of Mathematics
MA, Wabash College; MS, Southern Methodist University; PhD, Washington State University.

WOODCOCK, CATHERINE (1968), Associate Professor of Social Work
BA, University of Manchester; MSW, University of London.

WOODWICK, KEITH H. (1955), Professor of Biology
BS, Jamestown College; MS, University of Washington; PhD, University of Southern California.

WORSLEY, STEPHEN (1970), Associate Professor of Management and Marketing
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WRIGHT, EVELYN H. (1948) Counselor
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WRIGHT, FREEMAN J. (1969), Associate Professor of Political Science
BS, MS, Montana State University; PhD, Johns Hopkins University.

WRIGHT, SANFORD A. (1971), Lecturer in Social Work
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YAMAMOTO, MARJORIE (1971), Assistant Professor of Nursing
BS, Mount Saint Mary's College; MS, University of Colorado.

YEARY, PATRICIA C. (1971), Lecturer in Home Economics
BS, University of California at Los Angeles.

YEUNG, HENDERSON C. (1971), Assistant Professor of Mathematics
BS, University of Illinois; PhD, Kansas State University.

YOKOI, RITA S. (Spring 1971), Lecturer in Art
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YORK, WILLIAM L. (1968), Assistant Professor of Sociology
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ZANE, BURKE (1962), Acting Dean, School of Natural Sciences; Professor of Mathematics
BA, Fresno State College; MA, PhD, University of Oregon.

ZELDIS, JACK B. (1969), Assistant Professor of Linguistics
BA, University of Pennsylvania.

ZELLMER, DAVID L. (1969), Assistant Professor of Chemistry
BS, University of Michigan; MS, PhD, University of Illinois.

ZENDER, MICHAEL J. (1966), Associate Professor of Physics; Chairman, Physics Department
BA, St. John's University; PhD, Vanderbilt University.

ZIEGLER, STANLEY M. (1968), Assistant Professor of Chemistry
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ZITTERKOPF, MARILYN R. (1969), Librarian II
BA, Eastern Washington State College; MLS, University of Hawaii.

ZUMWALT, EUGENE E. (1959), Professor of English
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HOLMES, KENDALL (1972), Adjunct Professor of Allied Health
BA, University of Kentucky; MD, University of Michigan.

LARSON, ROGER K. (1972), Adjunct Professor of Allied Health
Northwestern University and Wheaton College; MD, University of Illinois.

PETERS, ROBERT (1972), Adjunct Professor of Nursing
AB, University of California at Berkeley; MD, University of California at Los Angeles.

ROBINSON, MASON (1972), Adjunct Professor of Nursing
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PART-TIME FACULTY, 1971–1972

ADAMS, PAUL D., Assistant in Mathematics
ALDRIDGE, JAMES, Lecturer in Criminology
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AYCOCK, LINNEA M., Lecturer in English
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BACKUS, REBECCA J., Lecturer in English
BARNETT, DENEISE, Lecturer in Advanced Studies
BASDEN, BARBARA H., Lecturer in Psychology
BERRY, ALICE, Lecturer in Psychology
BIXLER, MARK F., Lecturer in Chemistry
BLANTON, MARYALYCE, Lecturer in Home Economics
BOLTON, ELIZABETH A., Lecturer in Psychology
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BRECHMANN, JOHN J., Lecturer in Engineering
BROOKS, CHRISTINE M., Lecturer in Chemistry
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CANATA, NICK J., Lecturer in Plant Science
CAPELLE, DONALD G., Lecturer in Urban and Regional Planning
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COLLINS, SHAREN D., Lecturer in Home Economics
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COOPER, DAVID J., Lecturer in Social Welfare
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CUNNINGHAM, WILLIAM P., Lecturer in Criminology
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DeFRIES, WILLIAM A., Lecturer in Health Science
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GLASSOCK, LYNN, Lecturer in Music
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HO, BING-KING, Lecturer in Engineering
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