

Fresno State College Bulletin



General Catalog

1967 - 1968

FRESNO, CALIFORNIA

The California State Colleges

FRESNO STATE COLLEGE

Bulletin



Vol. XXI

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GENERAL CATALOG

FALL AND SPRING

1967-1968

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COLLEGE CALENDAR, 1967-1968

SUMMER SESSIONS 1967

Bakersfield.....	June 19-July 28, incl
Fresno.....	June 19-July 28, incl
Fresno Post-Session.....	July 31-Sept 1, incl

FALL SEMESTER 1967

All entering students should consult section on *Program Planning*.

Aug	7	Mon	Deadline for application by any student seeking admission or readmission. Applies to all persons not enrolled in campus classes Spring 1967.	
Sept	4	Mon	Holiday—Labor Day.	
	11	Mon	Academic year 1967-68 begins.	
	11	Mon	Faculty meeting, 10 a.m.	
	11	Mon	Meeting for all new undergraduate students. Men's Gym.	
	12-13	Tues-Wed	Orientation and advising for new students.	
	14-15	Thurs-Fri	Registration (See <i>Schedule of Courses</i>).	
	18	Mon	Instruction begins.	
	18	Mon	Late registration begins (\$5 fine).	
Oct	29	Fri	Last day for late registration.	
	29	Fri	Last day to file applications for degrees and credentials to be granted January 1968 without fine. Last day to file with fine December 1.	
	16	Mon	Last day to file application for spring semester 1968 student teaching.	
	27	Fri	Last day to drop a course without a fine.	
	Nov	10	Fri	Mid-term grade reports due from faculty.
		23-24	Thurs-Fri	Holiday—Thanksgiving.
	Dec	15	Fri	Last day to drop a course without INC or F grade.
		18	Mon	Christmas recess begins.
Jan	2	Tues	Classes resume.	
	18-25	Thurs-Thurs	Semester examinations.	
	22	Mon	Last day to file with Office of School of Graduate Studies completed and approved theses for master's degrees to be granted January 1968.	
	26	Fri	Fall semester ends.	

JUNE 1967

S	M	T	W	T	F	S
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JULY 1967

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30	31					

AUGUST 1967

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SEPTEMBER 1967

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OCTOBER 1967

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NOVEMBER 1967

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DECEMBER 1967

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31						

JANUARY 1968

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28	29	30	31			

SPRING SEMESTER 1968

Jan	2	Tues	Deadline for application by any student seeking admission or readmission. Applies to all persons not enrolled in campus classes fall 1967.
	31	Wed	Spring semester begins.
	31	Wed	Meeting for all new undergraduate students.
Feb	1-2	Thurs-Fri	Registration (See <i>Schedule of Courses</i>).
	5	Mon	Instruction begins.
	5	Mon	Late registration begins (\$5 fine).
	16	Fri	Last day for late registration.
	16	Fri	Last day to file applications for degrees and credentials to be granted June 1968 without fine. Last day to file with fine April 26.
Mar	13	Wed	Last day to file applications for fall semester 1968 student teaching.
	15	Fri	Last day to drop a course without fine.
	29	Fri	Mid-term grade reports due from faculty.
Apr	8-12	Mon-Fri	Easter recess.
	15	Mon	Classes resume.
	26	Fri	Last day to drop a course without INC or F Grade.
May	30	Thurs	Holiday—Memorial Day.
	31	Fri	Last day to file with Office of School of Graduate Studies completed and approved theses for master's degrees to be granted June 1968.
	29-June 5	Wed-Wed	Semester examinations.
	5	Wed	Fifty-seventh Annual Commencement.
	7	Fri	Academic year 1967-68 ends.

SUMMER SESSIONS 1968 (Tentative Dates)

First Session ----- June 17-July 26, incl
 Second Session ----- July 29-Aug 30, incl

FALL SEMESTER 1968 (Tentative Dates)

Sept	9	Mon	Faculty meeting.
	12-13	Thurs-Fri	Registration.
	16	Mon	Instruction begins.

FEBRUARY 1968	MARCH 1968	APRIL 1968	MAY 1968
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3	1 2	1 2 3 4 5 6	1 2 3 4
4 5 6 7 8 9 10	3 4 5 6 7 8 9	7 8 9 10 11 12 13	5 6 7 8 9 10 11
11 12 13 14 15 16 17	10 11 12 13 14 15 16	14 15 16 17 18 19 20	12 13 14 15 16 17 18
18 19 20 21 22 23 24	17 18 19 20 21 22 23	21 22 23 24 25 26 27	19 20 21 22 23 24 25
25 26 27 28 29	24 25 26 27 28 29 30	28 29 30	26 27 28 29 30 31
	31		
JUNE 1968	JULY 1968	AUGUST 1968	SEPTEMBER 1968
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1	1 2 3 4 5 6	1 2 3	1 2 3 4 5 6 7
2 3 4 5 6 7 8	7 8 9 10 11 12 13	4 5 6 7 8 9 10	8 9 10 11 12 13 14
9 10 11 12 13 14 15	14 15 16 17 18 19 20	11 12 13 14 15 16 17	15 16 17 18 19 20 21
16 17 18 19 20 21 22	21 22 23 24 25 26 27	18 19 20 21 22 23 24	22 23 24 25 26 27 28
23 24 25 26 27 28 29	28 29 30 31	25 26 27 28 29 30 31	29 30
30			

TRUSTEES OF THE CALIFORNIA STATE COLLEGES

EX OFFICIO TRUSTEES

- Ronald Reagan, B.A. State Capitol, Sacramento 95814
Governor of California and President of the Trustees
- Robert H. Finch, B.A., LL.B. State Capitol, Sacramento 95814
Lieutenant Governor of California
- Jesse M. Unruh, B.A. State Capitol, Sacramento 95814
Speaker of the Assembly
- Max Rafferty, B.A., M.A., Ed.D. 721 Capitol Mall, Sacramento 95814
State Superintendent of Public Instruction
- Glenn S. Dumke, A.B., M.A., Ph.D., LL.D., L.H.D.
5670 Wilshire Boulevard, Los Angeles 90036
Chancellor of the California State 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.

- Louis H. Heilbron, A.B., LL.B., LL.D. (1969)
14 Montgomery St., San Francisco 94104
- Donald M. Hart, B.A. (1968)
P.O. Box 1556, Bakersfield 93302
- Charles Luckman, LL.D., A.F.D. (1974)
9220 Sunset Blvd., Los Angeles 90046
- Paul Spencer, B.A. (1969)
1323 La Terracita Drive, San Dimas 91773
- Theodore Meriam, A.B. (1971)
P.O. Box 370, Chico 95927
- Albert J. Ruffo, LL.B., B.S. in E.E. (1971)
600 Bank of America Building, San Jose 95113
- Mrs. Philip Conley, B.A. (1972)
3729 Huntington Blvd., Fresno 93702
- E. Guy Warren, B.A. (1973)
P.O. Box 59, Hayward 94541
- Daniel H. Ridder, B.A. (1967)
604 Pine St., Long Beach 90801
- George D. Hart, A.B. (1967)
111 Sutter St., San Francisco 94104
- Gregson E. Bautzer, B.A., LL.B. (1968)
190 N. Cañon Dr., Beverly Hills 90210
- William A. Norris, B.A., LL.B. (1972)
609 South Grand Ave., Los Angeles, California 90017
- James F. Thacher, B.A., LL.B. (1970)
310 Sansome St., San Francisco 94104
- Victor H. Palmieri, B.A., LL.B. (1970)
10889 Wilshire Blvd., Suite 1550, Los Angeles 90024
- Alec L. Cory, B.A., LL.B. (1973)
530B St., Suite 1900, San Diego 92101
- Edward O. Lee, B.A. (1974)
1100 67th St., Oakland

OFFICERS OF THE TRUSTEES

Governor Ronald Reagan
President
Albert J. Ruffo
Chairman

Donald M. Hart
Vice Chairman
Chancellor Glenn S. Dumke
Secretary-Treasurer

OFFICE OF THE CHANCELLOR OF THE
CALIFORNIA STATE COLLEGES

5670 Wilshire Boulevard, Los Angeles, California 90036

Area Code: 213 Phone: 938-2981

Chancellor Glenn S. Dumke
Executive Vice Chancellor Raymond A. Rydell
Vice Chancellor, Academic Affairs
Vice Chancellor, Business Affairs Harry E. Brakebill
Assistant Chancellor, Faculty and Staff Affairs C. Mansel Keene

THE CALIFORNIA STATE COLLEGES

California State College, Dominguez Hills

809 East Victoria Street, Dominguez Hills, California 90247

Leo F. Cain, President

213 532-4300

California State College at Fullerton

800 North State College Boulevard, Fullerton, California 92631

William B. Langsdorf, President

714 871-3300

California State College at Hayward

25800 Hillary Street, Hayward, California 94542

Fred F. Harclerod, President

415 538-8000

California State College at Long Beach

6101 East Seventh Street, Long Beach, California 90804

Carl W. McIntosh, President

213 433-0951

California State College at Los Angeles

5151 State College Drive, Los Angeles, California 90032

John A. Greenlee, President

213 224-2011

California State College at San Bernardino

5500 State College Parkway, San Bernardino, California 92407

John M. Pfau, President

714 887-6311

California State Polytechnic College, Kellogg-Voorhis, Pomona, California 91766

Robert C. Kramer, President

213 964-6424

California State Polytechnic College, San Luis Obispo

San Luis Obispo, California 93401

Robert E. Kennedy, President

805 546 0111

Chico State College

First and Normal Streets, Chico, California 95926

Robert E. Hill, President

916 343-4411

Fresno State College

Shaw and Cedar Avenues, Fresno, California 93726
Frederic W. Ness, President
209 487-9011

Humboldt State College

Arcata, California 95521
Cornelius H. Siemens, President
707 822-1771

Sacramento State College

6000 Jay Street, Sacramento, California 95819
Robert Johns, President
916 454-6011

San Diego State College

5402 College Avenue, San Diego, California 92115
Malcolm A. Love, President
714 286-5000

San Fernando Valley State College

18111 Nordhoff Street, Northridge, California 91324
Ralph Prator, President
213 349-1200

San Francisco State College

1600 Holloway Avenue, San Francisco, California 94132
John Summerskill, Acting President
415 469-9123

San Jose State College

125 South Seventh Street, San Jose, California 95114
Robert D. Clark, President
408 294-6414

Sonoma State College

Rohnert Park, California 94928
Ambrose R. Nichols, President
707 795-2011

Stanislaus State College

800 Monte Vista Avenue, Turlock, California 95380
Alexander Capurso, President
209 634-9101

THE CALIFORNIA STATE COLLEGES

The California State Colleges are a unique development of the democratic concept of tax-supported public higher education for all qualified students.

Spanning the state from Humboldt County in the north to San Diego in the south, the 18 campuses of the California State Colleges (with another campus soon to be constructed) represent the largest system of public higher education in the Western Hemisphere, and one of the largest in the world. Current enrollment exceeds 170,000 full- and part-time students. The faculty and administrative staff numbers approximately 9,000.

The individual colleges, each with a geographic, curricular and academic character of its own, offer a solid basic program in the liberal arts. Beyond this, each college is noted for its individuality in academic emphasis which makes for a diversified system. Course offerings leading to the bachelor's and master's degrees are designed to satisfy existing student interests and to serve the technical and professional manpower requirements of the state.

The California State Colleges are dedicated to rigorous academic standards. Constant striving for academic excellence is at the heart of the system. The primary responsibility of each faculty within the system is the instructional process on the teacher-student level, with appropriate recognition of the necessary and constructive role of research in any institution of higher education.

Responsibility for the California State Colleges is vested in the Board of Trustees, which is appointed by the Governor, and the Board's administrative arm, the Chancellor. The Trustees and the Chancellor set broad policy for the colleges while delegating considerable independent responsibility for implementation at the college level. A statewide Academic Senate, made up of representatives elected by the faculty at each college, acts as a consultative body to the Chancellor in the area of academic affairs.

Although the oldest of the colleges, San Jose State College, dates back a century, the California State College system under an independent Board of Trustees was created by the Donahoe Act of 1960. Formerly, the colleges were under the jurisdiction of the State Board of Education.

Today, the California State Colleges are in a particularly dynamic period of their development. Prior to World War II, there were seven State Colleges with a peak total enrollment of some 13,000. Since 1947, eleven new colleges have been developed; and a site has been selected for a new college in Kern County. Enrollment in the system is expected to reach 225,000 by 1970.

FRESNO STATE COLLEGE ADVISORY BOARD

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

C. Stanley Awenius

Joe H. Dale, Jr.

Lewis S. Eaton

Ray E. Harris

Mrs. Dale Hillman

Mrs. Virginia J. Knowles

James B. Mayer

Ray M. Miles

Leon S. Peters, Chairman

Joseph R. Weirick

Melville F. Willson

Richard M. Worrel

Frederic W. Ness, 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 Manager for Association Activities.....Earl Whitfield

COLLEGE ADMINISTRATION, 1966-1967

EXECUTIVE

President	Frederic W. Ness
Assistant to the President	Wallace D. Henderson
Business Manager	Carl Levin
Director of Community Relations	Harold E. Green
Director of Related Educational Activities	Earle L. Bassett
Assistant Manager for Association Activities	Earl Whitfield
Executive Vice President	Harold E. Walker
Executive Dean and Director of Institutional Studies	Orrin D. Wardle
Administrative Assistant (Building Coordinator)	William R. Myers
Administrative Assistant (Institutional Studies)	Rose Shamlin
Dean of Students	W. Donald Albright
College Librarian	Henry M. Madden
Director of Instructional Media Center	Leonard H. Bathurst, Jr.
Director of Computer Center	John T. Emerson
Director of Athletics	Cecil N. Coleman

ACADEMIC

Academic Vice President	Dallas A. Tueller
Associate Vice President for Academic Planning	M. Bruce Fisher
Coordinator of Television	John P. Highlander
Coordinator of Honors Program	Barry L. Logan
Coordinator of Academic Administration	Paul J. McGuire
Dean of Educational Services and Summer Sessions	Edward M. Spencer
Director of Bakersfield Center	Leo P. Varner
Director of Extension Program	Arne J. Nixon
Dean of the School of Graduate Studies	Phyllis W. Watts
Coordinator of Graduate Studies	
Dean of the School of Agriculture	Lloyd Dowler
Assistant to the Dean	George F. Ilg
Dean of the School of Arts and Sciences	Dale C. Burtner
Assistant to the Dean	Russell E. Leavenworth
Assistant to the Dean	James H. Winter
Dean of the School of Business	McKee Fisk
Dean of the School of Education and Director of Teacher Education	Richard K. Sparks
Dean of the School of Engineering	Thomas H. Evans
Dean of the School of Professional Studies	Horace O. Schorling
Director of the Division of Social Work	Thomas M. Brigham

STUDENT PERSONNEL SERVICES

Dean of Students	W. Donald Albright
Assistant to the Dean, Coordinator Foreign Student Program	Robert G. Knudsen
Associate Dean of Students (Activities—Housing)	Gordon Wilson
Activities Advisers	Charles Sant'Agata, Sandra Speers
Housing Coordinator	Irie F. Horrall
Associate Dean of Students (Admissions—Records) and Coordinator of Relations with Schools	Harry E. Jones
Admissions Officer	William G. Pollock
Registrar	Robert R. Board
Evaluations Supervisor	Caroline Ryles

Associate Dean of Students (Counseling—Testing) and

Coordinator of Faculty Advising.....	Deryle K. Allen
Counselor.....	Kenneth E. Blood
Counselor.....	Charles R. Brasfield
Counselor.....	Viola A. Davis
Counselor.....	Evelyn H. Wright
Psychometrist.....	Beverly J. Aldrich
Test Officer and Counselor.....	Charles L. Wheeler
Coordinator of Financial Aids.....	Kenneth E. Lewis
Assistant Coordinator.....	Ray E. Brewer
Director of Health Services.....	Marvyn S. Schwartz, M.D.
Physician.....	Donn R. Cobb, M.D.
Supervising Nurse.....	Anna Edwards
Director of Placement.....	Harold D. Jones
Placement Supervisors.....	Gladys Ekizian, Vivienne Jordan

BUSINESS MANAGEMENT

Business Manager.....	Carl Levin
Administrative Assistant (Budget Officer).....	Henry Roberts
Accounting Officer.....	George T. Weybright
Chief of Security.....	Douglas F. Bambridge
Purchasing Officer.....	Ralph D. Koerber
Personnel Officer.....	William M. Coughran
Housing Manager.....	Lavon C. Erickson
Superintendent of Buildings and Grounds.....	Ashton H. Shields

SCHOOL DEANS AND DEPARTMENT CHAIRMEN, 1966-1967

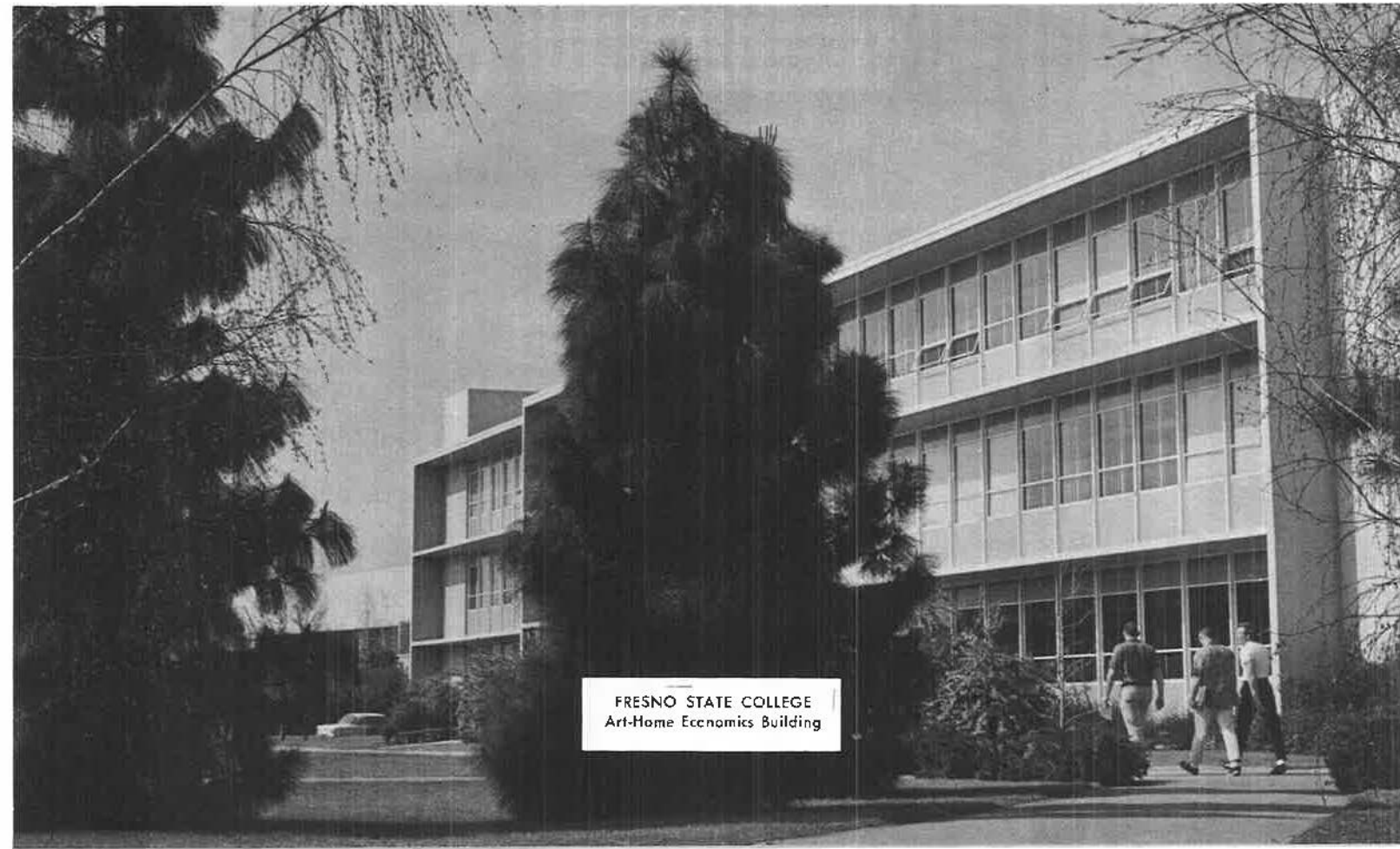
School of Agriculture	Lloyd Dowler
Agricultural Mechanics Department	Clarence D. Jensen
Animal Science Department	Jesse T. Bell
Plant Science Department	Wayne E. Biehler
School of Arts and Sciences	Dale C. Burner
Anthropology-Sociology Department	William C. Beatty, Jr.
Art Department	Frank B. Laury
Biology Department	Keith H. Woodwick
Chemistry Department	Richard P. Ciula
Economics Department	Richard C. Spangler
English Department	Robert S. Billings
Foreign Language Department	Edgar A. List
Geography Department	Chester F. Cole
Geology Department	C. Noble Beard
History Department	Jose C. Canales
Mathematics Department	Anthony E. Labarre, Jr.
Music Department	Ralph C. Rea
Philosophy Department	Robert L. Mathers
Physical Education and Recreation Department	Cecil N. Coleman
Physics Department	Frederic A. Scott
Political Science Department	Karl E. Buckman
Psychology Department	Stanley E. Lindquist
Speech Arts Department	Phillip N. Walker
School of Business	McKee Fisk
Accounting and Quantitative Studies Department	Clayton R. Tidyman
Finance and Industry Department	Robert A. Carr
Management and Marketing Department	Donald G. Halper
Office Administration Department	Helen F. Rohrer
School of Education	Richard K. Sparks
Advanced Studies Department	Morris L. Bigge
Elementary Education Department	Glenn F. Leslie
Secondary Education Department	Edwin J. Swineford
School of Engineering	Thomas H. Evans
School of Professional Studies	Horace O. Schorling
Aerospace Studies Department	Eugene C. Watkins
Criminology Department	Frank M. Boolsen
Health Education Department	Henry F. Fricker
Home Economics Department	Ratana S. Newsome
Industrial Arts and Technology Department	Frank E. Schroeter
Journalism Department	Paul V. Sheehan
Nursing Department	Fannie L. Gardner
Division of Social Work	(Director) Thomas M. Brigham

LIBRARY

College Librarian	Henry M. Madden
Librarian IV	Lillie A. Parker, Virginia C. West
Librarian III	Sara C. Berry, Stephanie Hillman, Erland L. Jacobsen, Gary B. Kellogg, Elizabeth A. Landrum, J. Printise Womack
Librarian II	Nazaly Bagdasian, Donald G. Davis, Jr., Arthur G. Gothe, Ronald J. Harlan, Ann Hopping, Charlotte M. Lowery, Pauline Micciche, Edith M. Quibell, Lois M. Scarboro, Tse-feng Ting, Elizabeth Tuchin, Grace T. Waibel, Larry T. Welch
Librarian I	Susanne A. Haffner, Ruth A. Kallenberg, Chu-chu Tao



FRESNO STATE COLLEGE
Memorial Court and Administration Building



FRESNO STATE COLLEGE
Art-Home Economics Building

FRESNO STATE COLLEGE

GENERAL INFORMATION

FUNCTIONS

The primary function of Fresno State College, as one of the California State Colleges, is to provide undergraduate and graduate instruction through the master's degree, in the liberal arts and sciences, in applied fields and in the professions, including the teaching profession. Faculty research is authorized to the extent that it is consistent with the primary function of the college and the facilities provided for that function.

At Fresno State College an effort has been made to provide the type of undergraduate and graduate program which will develop competence in an individual as a student, a citizen, and an effective leader. The program of studies provides curricula, including general and specialized courses, designed to prepare students in a wide variety of fields. The program offers educational opportunities in preparation for the professions and for many occupations, including managerial and technical positions in agriculture, industry, business, and government. In its service role for the region, the college provides continuing and in-service education at an advanced level, serves as a consultant center for public agencies, school systems, and private business enterprises, and conducts research consistent with its functions.

HISTORY

The broad nature of the educational opportunities and services offered by Fresno State College comes naturally from its twofold origin. In 1910 the first junior college in California was established in Fresno. The following year a state normal school was authorized. These two institutions—one providing general and vocational training and the other preparation for teaching—were directed by a single administration. As they grew, they were temporarily separated; but in 1921, with the expansion of the courses for teachers to four years with authority to grant the bachelor of arts degree, the two kinds of college service were again united. In 1935 the official name was changed to Fresno State College, with authority to carry on various types of college work leading to bachelor's degrees, either with or without courses required for teaching credentials. In 1946 the college was authorized to offer a fifth year of graduate work leading to the general secondary credential. Three years later in 1949 came another important advancement in the academic program of the college with the authorization for granting the master of arts degree for teaching service. In 1955 this authorization was extended to include the occupational master of science degree, and in 1958 it was further extended to permit a liberal arts emphasis in the master of arts degree. In 1961 the administration and control of the California state colleges was transferred from the State Board of Education to the Trustees of the California State Colleges.

As a result of the growth of the college in numbers of students and faculty and in the variety and complexity of its programs, it has undergone a major academic reorganization which is represented for the first time in this issue of the *General Catalog*. The former organization of twelve instructional divisions has been replaced by six schools, a division which operates as a school, and the School of Graduate Studies. Comparable changes are taking place in many of the state colleges in accordance with guidelines adopted by the Trustees.

In its rapid development during recent years the college has emphasized not only a variety of offerings suited to the special needs of its students, but also the personal attention and guidance which help students to gain a clear understanding of their own abilities and interests and to select appropriate programs.

Serving a population of approximately one million, Fresno State College has had most favorable conditions for its development and for meeting the needs of the young people of the San Joaquin Valley.

NATIONAL RATING AND ACCREDITING

The college is accredited by the California State Board of Education and the Western Association of Schools and Colleges, and is a member of the Western Association of Graduate Schools. It is a member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary teachers, secondary teachers, and school service personnel, with the master's degree as the highest degree authorized; accreditation for the school service personnel category is limited to elementary principals and supervisors, secondary principals and supervisors, and guidance workers. The School of Business is a member of the American Association of Collegiate Schools of Business. The Chemistry Department is approved by the American Chemical Society. The Nursing Department is accredited by the National League for Nursing and the California State Board of Nursing Education and Nurse Registration. The Journalism Department is accredited by the American Council on Education for Journalism; its news editorial sequence is specifically accredited by the Council. The School of Engineering is accredited by the Engineers' Council for Professional Development. The Division of Social Work holds both undergraduate and graduate membership in the Council on Social Work Education and its two-year professional Master of Social Work program is accredited by the Council.

BUILDINGS AND FACILITIES

Fresno State College is located on a 1410-acre site at Cedar and Shaw Avenues in the northeast section of the City of Fresno. The major buildings on the campus are administration, agricultural classroom, agricultural mechanics, art-home economics, bookstore, business, cafeteria, education-psychology, engineering, home management cottage, industrial arts, laboratory school, library, men's gymnasium, music, science, social science, speech arts, student health service, and women's gymnasium. A large amphitheatre is located between the speech arts and music buildings to accommodate commencements, convocations, and other large assemblages. Three residence halls are located on the campus. Frank A. Homan Hall houses 208 men; Mary Baker Hall and George West Graves Hall house 416 women. Plans call for the construction of other new buildings and additions to existing buildings to meet the enrollment increases anticipated during the next several years.

The major academic buildings on the Shaw Avenue Campus, first occupied during the 1953-1954 school year, are located within a 220-acre area. These modern buildings are surrounded by beautiful trees, shrubbery, flowers, and broad expanses of grass. A lovely fountain graces the handsome Memorial Court in the center of the campus. Walkways, bordered by occasional benches, interlace the campus, providing for a free flow of student traffic between the buildings. Parking areas are located within and around the fringe of the 220-acre area.

The College Farm consists of 1190 acres and 43 farm buildings which together with livestock and equipment provide one of the most modern and best equipped agricultural plants in the west.

Located in the vicinity of the former campus approximately five miles from the Shaw Avenue Campus are Ratcliffe Stadium, on Blackstone and University Avenues, and the University Avenue Extension Center, at Van Ness and University Avenues.

The college makes special arrangements for use of facilities in Bakersfield for the Bakersfield Center and in other valley communities for summer session and extension programs.

LIBRARY

The College Library is housed in a building completed in 1965. Its resources include 223,000 catalogued volumes, 120,000 government publications, 29,000 pamphlets, 30,000 maps, and 19,000 pictures and prints. Over 1,900 periodicals are received on subscription. Special collections include the Roy J. Woodward Memorial Library of Californiana and the College Archives. A collection of 7,300 volumes in the College Laboratory School Library provides a model library for an elementary school. The Music Library has over 10,000 phonodiscs and tapes. The library building accommodates 1,375 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 seventy-seven hours a week, during hours posted at the entrance to the building.

SCHEDULE OF FEES

Note: Fees are subject to change by the Trustees of the California State Colleges.

For each student enrolled for more than 6 units:

Materials and service fee, per semester	\$45.00
Association fee and health service fee, per semester (not a state fee)	12.00
College Union fee (not a state fee)	9.00
Total, per semester (California resident)	\$66.00

For each student enrolled for 6 units or less:

Materials and service fee, per semester	22.50
Association fee, per semester (not a state fee)	5.00
College Union fee (not a state fee)	4.50

Nonresident* tuition fee, per semester in addition to other fees:

Each nonresident student enrolled for 15 units or more	360.00
Each nonresident student enrolled for less than 15 units, per unit or fraction	24.00
Each foreign visa student enrolled for 15 units or more	127.50
Each foreign visa student enrolled for less than 15 units, per unit or fraction	8.50

Note: Auditors pay the same fees as students registered for credit.

Extension, per unit:

Lecture or discussion course	15.00
Activity course	19.50
Science laboratory course	30.00
Summer session courses, per unit	19.75

Other Fees:

Application for admission fee (nonrefundable; \$10, spring 1968)	\$5.00
Diploma fee (not a state fee)	3.00
Transcript of record (no charge for first copy)	1.00
Thesis binding fee, 4 copies (not a state fee)	16.50
Additional copies, per copy	4.25
Organ practice, per semester	10.00
Studio lesson, per lesson	1.00 to 6.00

Credential fee (collected for State Department of Education, \$10 each credential)

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	cost plus 1.00

Residence Hall Rates:

Room and board, per semester each student	\$442.50
(Includes room, three meals per day Monday through Friday, and breakfast and dinner on Saturdays and Sundays during the time college is in session)	

* 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 College attorney on residence matters has sole authority to make resident determinations.

Note: See *Financial Assistance*.

session; accident, sickness and hospitalization insurance; residence hall social dues.)

Parking Fees:

Student enrolled for more than 6 units, per semester	\$13.00
Student enrolled for 6 units and less, per semester	6.00
Summer session—Fresno Campus Session	5.00
Post session—Fresno Campus	4.00

REFUND OF FEES

Refund of Registration Fees

After a student makes a formal withdrawal through the Student Records Office, a refund of a portion of the *materials and service fee* may be made if written application for refunds is filed not later than fourteen calendar days after the first day of instruction. A student shall make the application personally if he is able to do so. If, in the opinion of the administration, a student is unable to make the application personally, 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 *Education 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 \$2 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 because of compulsory military service, at any time prior to the date when the student receives any academic credit for any course or courses for which he is registered. The *late registration fee* is not refundable. If a student reduces his units to fall within a lower fee category within the first two instructional weeks of the session, makes a formal change of program through the Student Records Office, and files a written application for refund within this time limit, the differential may be refunded except for the cost of materials and services used, plus \$2 to cover registration costs.

The same withdrawal and application for refund procedure applies for the *nonresident tuition fee* except that the time limit is different. Within the first week of the session, a full refund may be made. 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.

Refund of 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 decals so issued. If any of the foregoing items are 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 items.

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.)

Refund of Other Fees

The schedule of refunds for the *association fee and the health service 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 student body card turned in to the Association Office.

The *extension tuition fee*, less \$5.00, may be refunded upon formal withdrawal and the filing of written application on the official form provided by the Extension Office prior to the fourth meeting of the class. No refund is made for one-unit classes.

A partial refund of the *summer session* fee may be made, if applications for withdrawal from classes and return of fees are filed within required time limits. See the *Summer Session Bulletin*.

REGULATIONS AND PROCEDURES

ADMISSION TO THE COLLEGE

Requirements for admission to Fresno State College 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 June 4, 1966. 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.

ADMISSION AS A FRESHMAN

An applicant who has had no college work will be considered for admission under one of the following provisions. Except as noted, submission of the results of the Scholastic Aptitude Test is required.

California High School Graduates and Residents

An applicant who is a graduate of a California high school or a legal resident for tuition purposes must have a grade-point average and total score on the SAT which provides an eligibility index placing him among the upper one-third of California high school graduates. (For 1967-68 the minimum eligibility index is SAT-3072. It is computed by multiplying grade-point average by 800 and adding it to the total SAT score.) The grade-point average is based upon the last three years and does not include physical education or military science. The table below does not cover every case, but gives several examples of the test score needed with a given grade-point average to be eligible for admission.

Grade-Point Average:	3.21 and above	2.80	2.40	2.00	1.99 and below
SAT Needed:	Any score	832	1,152	1,472	Not eligible

Nonresidents Graduating From High Schools in Other States or Possessions

An applicant who is a nonresident for tuition purposes and who is a graduate of a high school in another state or a United States possession must have an eligibility index which would place him among the upper one-sixth of California high school graduates for 1967-68. The minimum required eligibility index is SAT-3402 and is calculated as in the previous section.

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 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 student still enrolled in high school will be considered for enrollment in certain special programs if he is recommended by his principal and his preparation is equivalent to that required of eligible California high school graduates. Such admission is only for a given program and does not constitute the right to continued enrollment. Such applicants are not required to take the SAT.

Other Applicants

An applicant 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.

Certificate Programs

Technical Agriculture: High school graduates may be admitted to the technical agriculture program in accordance with provisions listed in the School of Agriculture.

Public Administration: Applications for admission to the public administration certificate program must be approved by the Political Science Department. For information on program requirements consult the department adviser. (See also *Political Science Department.*)

CEEB Advanced Placement

The college offers advanced placement and credit for those students who take the College Entrance Examination Board advanced placement examinations. The granting of credit and advanced placement is at the discretion of the department. For further details see the advanced placement statements in the History and Mathematics Departments.

Placement or Credit Granted for Other Precollege Study

At the time of registration a freshman student may challenge one or more existing courses and be given the opportunity of attempting to obtain credit in them by examination (see *Credit by Examination*). A student who has earned high school credit for work comparable to that of a lower division college course may, with the approval of the department chairman and usually after the administration of an examination, be permitted to begin his college work at the level for which he is prepared. Under these circumstances no course credit is given for courses which the student is not required to take. The Chemistry, Foreign Language, and Mathematics Departments made special provisions for the placement of incoming students at the appropriate level. Students who have taken the College Entrance Examination Board Advanced Placement Examination should consult the Dean of Admissions.

Recommended Preparation

Overall excellence of performance in high school subjects and evidence of academic potential provide the basis for admission at Fresno State College. 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 minimally adequate background for college work:

1. College preparatory English.
2. Foreign language.
3. College preparatory mathematics.
4. College preparatory laboratory science.
5. College preparatory history and/or social science.
6. 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.

Admission of Undergraduate Transfer Students

General Qualifications. Applicants for admission to the college as undergraduate transfer students must qualify under one of the provisions specified below.

All entering undergraduate students at Fresno State College, except foreign students whose native language is not English, are required to submit scores on the College Entrance Examination Board Scholastic Aptitude Test (SAT). Students transferring with 60 or more units may as an alternative submit scores on the ACT; such scores must be provided directly by the American College Testing Program, P.O. Box 168, Iowa City, Iowa 52240.

Applicants With 60 or More Semester Units

An applicant who has completed 60 or more semester units or the equivalent will be admitted if he has achieved a grade-point average of 2.0 (C) on all acceptable college work attempted and he was in good standing at the last college attended. (See also *Regulations and Procedures—General Information.*)

Applicants With Fewer Than 60 Semester Units

An applicant who has completed fewer than 60 semester units or the equivalent may be admitted if he meets the above requirements and he meets requirements currently in effect for first-time freshmen; or, if he has been in full-time continuous enrollment at a college since his graduation from high school, he meets the requirements in effect for first-time freshmen at the time of his high school graduation.

Applicants With Particular Majors

An applicant 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 the college, succeed in that degree objective.

Other Applicants

Only under the most unusual circumstances will an applicant not meeting either of the above provisions be considered for admission. Permission is granted by special college action.

ADMISSION TO GRADUATE STUDY

(See *School of Graduate Studies*)

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 a bachelor's degree or higher from an accredited institution.

AUDITORS

Students enrolling as auditors only must meet admissions deadlines and be cleared by the Admissions Office. Written permission of instructors must also be secured and filed at registration before enrolling as an auditor for one or more courses without credit. Auditors must register 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. Students enrolled for credit in any class may not transfer to audit status after the first six weeks. 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.

ADMISSION PROCEDURE

Applications for the fall semester are accepted beginning December 1 and applications for the spring semester are accepted beginning October 1.

For undergraduate admission to Fresno State College a student must:

1. Submit an application on a form provided by the Admissions Office and pay the \$5 application fee to the College Business Office.
2. 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.
3. Take the Scholastic Aptitude Test of the College Entrance Examination Board and have copy of the results sent to the college Admissions Office.
4. Take any additional entrance examinations required.
5. Veterans must, in addition, file with the Admissions Office a copy of Notice of Separation from military service.

Application for admission must be filed by the deadlines published in the College Calendar; these are usually at least one month prior to the beginning of the semester for which the student plans to enroll. The college cannot assure before registration that an applicant has approval to register, nor can it provide evaluation of prior records unless all legal documents are also submitted by the deadline dates. Applicants for reinstatement will be held strictly to these deadlines.

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

GENERAL INFORMATION

All transcripts submitted by matriculated students are retained by Fresno State College.

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 degree for work completed in a junior college and no upper division credit is given. Junior college credit in excess of 70 units may be used to satisfy subject requirements, but may not be applied toward the total units required for a bachelor's degree.

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

Advanced Standing Credit for Registered Nurses

Completion of the three-year course in nursing at an accredited hospital and the possession of the California R.N. license will entitle the student to receive 30 units of lower division credit toward a bachelor's degree, granted after completion of all other degree requirements. This credit allowance will be given to registered nurses who are candidates for bachelor's degrees with majors other than nursing. Credit received from a junior college or four-year college for courses taken as part of a three-year hospital nursing program will be allowed in addition to the 30 units.

Registered nurses who are candidates for the bachelor of science degree with major in nursing must meet the requirements of the Nursing Department. See *Nursing Department*.

ENTRANCE EXAMINATIONS

All but two categories of entering undergraduate students are required to submit scores on the College Entrance Examination Board Scholastic Aptitude Test (SAT). The two excepted categories include (1) foreign students from non-English speaking countries and (2) students who have taken the ACT test for entrance to another of the state colleges and who subsequently have been diverted to Fresno State College because of closed enrollment.

The College Entrance Examination Board has established testing centers throughout the country where students may take the Scholastic Aptitude Test (SAT). Information may be obtained from local high schools and colleges regarding test schedules, application for test reservations, and payment of the \$5.00 registration fee which must be sent to the Education Testing Service. Also, students may obtain information by writing to the College Entrance Examination Board at Box 1025, Berkeley, California, if they live in the western states; students living east of Colorado should write to the Board at Box 592, Princeton, New Jersey.

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.

Reading Examination: Because success in college is dependent upon efficiency in reading, accurate information about a student's degree of reading skill is essential to intelligent planning of his program. To provide this information, Fresno State College requires all entering undergraduate students to take a reading test. Students must file reservations for this test on forms provided by the Admissions Office. Students whose scores on this test are low should enroll in English 6.

English Examination: Entering undergraduate students must take an objective examination which measures competence in spelling, grammar, diction, sentence structure, and punctuation. Students must file reservations for this examination on forms provided by the Admissions Office. Following the examination students will be notified of test results and eligibility for English courses. Transfer students who have completed freshman English or who have satisfactorily completed a course in English fundamentals equivalent to English A, 1, or the former English 3 at another collegiate institution are excused from the examination.

English Proficiency Test for Foreign Students: A language proficiency test in English is required of all foreign students who are applying for admission from non-English speaking countries. The college requires that students take the *Test of English as a Foreign Language (TOEFL)*, administered by the Educational Testing Service at testing centers throughout the world. TOEFL is an objective examination designed to assist the college in determining whether the foreign student's comprehension of and ability to use the English language is adequate for the academic demands of 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 Speech 76. See *School of Education—Admission to Credential Programs*.

Medical Examination: A medical examination is required of each regular student upon entrance as a condition of registration. Later examinations may be required at a time college authorities deem it necessary. Candidates for teaching credentials are required to secure approval of the Health Services at the time of application for admission to credential programs, and upon assignment to directed teaching. A teaching credential may not be issued to any candidate who does not possess satisfactory physical and mental health to meet fully the responsibilities of a teacher.

PROFICIENCY TESTS

Proficiency tests are required by some departments prior to students entering or being admitted to certain courses or curricula in business, chemistry, engineering, foreign language, mathematics, music, physical education, physics; and teacher education. The test results are used to program students in those studies for which they are prepared. Some of the proficiency tests are administered by the Testing Office; others are administered by the departments concerned. Consult department advisers for further information.

STATEMENT OF RESIDENCE

A Statement of Residence must be completed prior to registration for each student. Students in continuous attendance during successive semesters are not required to file statements of residence after the initial filing. Any break in attendance requires a new Statement of Residence. Students are held responsible for reporting any change in residence status. A statement will be mailed to each new or returning student with the application forms. The forms should be completed and returned to the Admissions Office with the application.

Summer session and extension students are not required to file Statements of Residence.

PROGRAM PLANNING

Freshman students should begin to plan their programs as early as possible. A first step, when practical, is to select a major. Degree requirements in each major are listed under the appropriate department and in the section on degrees and credentials.

Students will be given help in planning their programs by academic advisers, but the primary responsibility for meeting requirements falls on the student. The catalog should be carefully read and the proper college offices consulted for additional information. The *Schedule of Courses* must be followed when planning a particular semester's program.

The following are among the sections of this catalog students should study carefully:

Admission to the College	General Education
Advanced Placement	Housing
College Calendar	Pass—Withdraw
Concurrent Registration	Probation
Counseling Services	Registration
Course Requirements	Regulations-Procedures
Degrees and Credentials	Repetition of Courses
Entrance Examinations	Residence Requirements
Extension Credit	Schedule of Fees
Financial Assistance	Scholarship Requirements
Foreign Language	Special Programs
Foreign Students	Statement of Residence
	Upper Division Credits

TRANSFER STUDENTS

Students intending to transfer to Fresno State College 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. See provisions for *General Education*.

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

will receive the advanced standing evaluation before registration; otherwise applicants will be processed during the semester.

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 former students in good standing. Former students returning after an absence of one semester or more must file in the Admissions Office a form requesting readmission by the deadline date published in the *College Calendar*. Students seeking readmission will be held strictly to this deadline. 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 \$5 application fee for readmission. The *College 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.

Students transferring between the Fresno campus and the Bakersfield Center should notify the Admissions Office where they intend to enroll well in advance of registration. This does not apply to any Summer Session, see *Educational Services*.

SCHEDULE OF COURSES

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

CONCURRENT REGISTRATION

Approval must be obtained in advance of registration from the Registrar 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 planning to register for more than 17 semester units must obtain permission from the School Dean or Division Chairman to carry maximum programs. In general for undergraduates, requests to take units above the maximum will be granted on the following basis: 18 semester units may be approved if the student has a 2.5 grade-point average or above (on a 4 grade-point system); more than 18 semester units may be approved if a 3.0 grade-point average has been maintained.

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 for the course concerned. Upper division credit may not be granted until a student has 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*.

PROGRAM CHANGES

Each student is held responsible for the program of courses listed at the time of registration. After the program has been filed, no changes will be made without completion and filing of the forms provided by the Student Records Office. The change is not recorded until these forms are properly filled out and filed in the Student Records Office. No courses may be added after the second week of the semester; courses dropped after the first six weeks incur a fine of \$1.

CHANGE OF MAJOR

Each student who wishes to change his major should report to the Counseling Office to initiate the procedure. The Counseling Office will in turn notify the departments concerned so that advisement records may be forwarded to the new department and a new adviser may be assigned.

WITHDRAWAL FROM COURSES

Withdrawal from any course after filing the program requires written application on forms provided by the Student Records Office. Withdrawal without this procedure results automatically in a failing grade. A properly filed written application for withdrawal before the end of the third week permits a student to drop a course without having the course listed on his record. A properly filed written application for withdrawal after the third week but more than six weeks before the end of the semester permits a student who is doing passing work, to drop a course with a *W* recorded on the transcript; otherwise the dropping of a course during this interval will be recorded as a failure. A properly filed application for withdrawal during the final six weeks of the semester permits, with the approval of the instructor, a student whose work is of passing quality to withdraw with an incomplete recorded on his transcript; if not passing, a failure (*FW*) is recorded. No program changes, other than complete withdrawal, may be made during the last two weeks of the semester. A fine of \$1 will be assessed for application to withdraw from a course after the first six weeks of the semester, unless the student is applying for a complete withdrawal for the semester. See *Refund of Fees*.

WITHDRAWAL FROM COLLEGE

Students withdrawing from college must file written application on the forms provided by the Student Records Office. Applications filed before the end of the third week of the semester will enable the student to withdraw without having classes recorded. Applications filed after that time will be subject to the same rules as requests to withdraw from individual courses except that a *W* may be given in any course, on withdrawal from college during the last six weeks of the semester, if the work in the course is of passing quality. See *Refund of Fees*.

SCHOLARSHIP REQUIREMENTS

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.

FW—Withdrawal with mark F, or failure to withdraw officially.

INC—Semester requirements less than one-third incomplete, work of passing grade.

IP—Continuing work in progress, status satisfactory.

P—Passed without grade.

W—Official withdrawal.

AU—Audit.

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.

The IP and P grades may be used only in courses designated in advance by the appropriate School Dean. 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 does the INC.

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, FW—Units counted, no grade points.

AU—No units or grade points allowed.

The above grade point system was effective September 1, 1964. Prior to that date the grade of INC was counted in units attempted but no grade points were allowed. Between September 20, 1956, and September 15, 1961, grade points were computed as follows: the E grade was used for Condition to be changed to D when condition was removed; P counted two grade points per unit of credit; E counted no grade points per unit. Prior to September 20, 1956, the system was: A, 3 grade points; B, 2; C or P, 1; D, E, F, FW, INC, 0. Prior to September, 1948, grades E, F, FW, and INC carried minus one grade point per unit. An incomplete, when properly made up, will receive the units and grade points appropriate to the mark finally earned.

Since September, 1941, 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. Effective September 19, 1957, a repeated course has been counted as units attempted and is credited with the appropriate grade points earned by the repetition. Prior to the fall semester, 1957, the grade made upon repetition was accepted in place of that established earlier and units attempted were not charged. 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. 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 College is below a C average. A student will be continued on probation until both his over-all and his Fresno State College 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 College record equal to or greater than that indicated below.

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

See also *School of Graduate Studies*.

READMISSION

A student disqualified from Fresno State College 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 student 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. A student who has been disqualified more than once may not be readmitted except under the most unusual circumstances.

TRANSCRIPTS AND REPORTS

Transcript of Record. One official transcript of his record at Fresno State College is furnished each student free of charge. Each additional copy requires a fee of \$1 paid in advance. 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 be retained except in cases where the student fails to register.

Reports to Students. Grade reports are mailed to students at the close of each semester. At mid-term a report is given to all students both as a verification of the student's official program and as a report of any unsatisfactory progress.

CREDIT BY EXAMINATION

Credit by examination may be earned in some cases if the following procedures are used.

1. The applicant must be a registered student at Fresno State College and must enroll in the course during registration. Normally the student will confer with the department and complete his application form well in advance of registration.

2. The application must be filed in the Student Records Office at the time of registration. The examination must be completed by the end of the *second* week of instruction. The grade must be filed before the close of registration, normally by the end of the *third* week.

3. A student will be notified by the Student Records Office after the close of the semester that the entry of the examination has been made on his record.

For further information consult the department concerned (see also *Advanced Placement*).

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 approved 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. Credit is limited to a maximum of three units per semester. Under extraordinary circumstances more than three units of credit per semester may be allowed on petition to the department chairman.

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. Having secured these prior approvals, a student registers for a 190 or a 290 course 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.

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

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 is being introduced on a limited and experi-

mental basis beginning in September, 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. Its limitations are also designed to permit adequate evaluation of the procedure as it affects instruction and administrative procedures.

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 that grade A, B, or C 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. Those in which P-W grading will be possible will be indicated in the *Schedule of Courses*. Further directions concerning enrollment procedure will also be found there.

2. A student must be in good standing (not on probation) and must have completed less than 60 units at the time of enrollment.

3. A student may enroll in only one course in a semester or term on a P-W basis. A maximum of 15 units of such courses may apply to the total units required for the degree. A course taken on this basis will not normally apply to the satisfaction of a major or a credential requirement.

4. A course enrolled in on a P-W basis will not be taken into account in the computation of the grade-point average.

STUDENT PERSONNEL SERVICES

The student personnel program provides an organized administration of educational services designed to support the instructional program. These services include admissions and records, relations with schools, counseling, testing, student activities, housing, foreign student assistance, financial aids, placement services and student health. 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 or elsewhere in this catalog.

COUNSELING

Admissions Counseling. 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 record should be directed to the Associate Dean of Students (Admissions-Records).

Vocational Counseling. The Counseling Office assists students in self-appraisal of their unique interests and aptitudes and in their search for a vocational goal for which they are best fitted. Psychological and vocational tests are used as needed and a library of vocational information is provided. Each academic department provides vocational advising pertinent to its field.

Educational Counseling. The academic advising program is coordinated and serviced through the Counseling Office. 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 academic 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 Counseling Office assists students who are failing to meet scholarship standards. Counseling and testing are designed to help students to discover weaknesses and to plan remedial measures.

Personal Counseling. The Counseling Office provides services for students with adjustment problems of a personal nature. Clinical psychologists are available in the Counseling Office and limited psychiatric consultation is available in the Health Services Office.

Selective Service Counseling. Male college students may qualify for a student deferment (2-SC) to complete their college work. In general, this type of deferment is granted by a draft board to a student who is making satisfactory progress toward a degree and whose "activity in study is found necessary to the national health, security, and interest." A draft board will also grant mandatory deferments (1-SC) effective until the end of the college year to students who are registered as full-time students at the time they are ordered to report for induction. All male students are urged to keep themselves informed as to their draft status and to keep their draft board informed of their attendance, progress, and class rank. For further information, consult the Student Activities Office.

FOREIGN STUDENTS

Fresno State College regularly enrolls a significant number of students from abroad. The Coordinator of the Foreign Student Program assists foreign students in matters pertaining to visas, passports, dollar exchange, work permits, practical training, trips outside the United States, health insurance, and housing, as well as with personal and academic problems. (See *Student Housing*)

Campus and community groups sponsor social, cultural, and educational activities which involve foreign students and are designed to enhance their educational experiences in the United States. Students should consult the Coordinator of the Foreign Student Program immediately upon arrival on the campus. (See *Regulations and Procedures—Admissions*)

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 *English Proficiency Test for Foreign Students*). Except for the few who are employed as graduate assistants, they must have sufficient funds so that they will not need employment during the first year at the college and should plan to take the minimum legal number of courses each semester. Undergraduate students on "F" or "J" type visas must register for 12 units or more each semester.

Foreign Graduate Students (See *School of Graduate Studies*)

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.

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

During hours when the Health Service is closed, a qualified student may contact his own physician, in which case the 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. Should hospitalization for a qualified student be necessary, the Health Service will allow \$10 per day for five days toward the cost of hospitalization which is not otherwise covered by insurance. In addition, an excellent student sickness and accident insurance policy is offered through the Health Service.

PLACEMENT SERVICE

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

The placement service seeks more efficient utilization of college manpower by assisting students of the college and alumni in seeking positions which will best utilize 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, and the public school system, and to 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; maintain a current record of employment opportunities; recommend candidates for positions at the request of employers; arrange for interviews between candidates and employers; provide guidance to candidates seeking positions; bring the needs of the employer to those who design and implement the training program; and conduct a follow-up program of candidates placed in positions.

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

Membership in the Office of Placement 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 12 semester units of work has been completed at Fresno State College; (2) to anyone who holds or will receive a master's degree in the semester prior to date of employment provided a minimum of 12 semester units has been completed at Fresno State College; (3) to students who have met the Fresno State College conditions for partial fulfillment of requirements for elementary teaching under the new credential law, including student teaching; and (4) to those in the internship program who complete requirements for a credential.

Business, Industrial, and Governmental Placement

Membership in the Office of Placement 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 Office of Placement early during the year in which they expect to graduate. Close cooperation is maintained with the various divisions and departments in the placement of candidates in these fields.

Student Placement

Many students earn part of their college expenses. Entering freshmen, however, should be prepared to finance their first semester of college attendance without working; and all students should keep their outside employment to a minimum so that the total program does not endanger either health or academic achievement.

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

STUDENT LIFE

College students are expected to assume the responsibilities for personal conduct appropriate to their age and maturity. Wide freedom is therefore granted by the college 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 regula-

tions 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 college requirements are administered in accordance with college policies.

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-student committees and 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.

STUDENT CONDUCT

Students are expected to conduct themselves in a manner compatible with the educational purposes of the college, to observe college regulations and to be responsible for their personal behavior. Disciplinary action involving reprimand, probation, suspension, or expulsion may be assessed for violation of established rules or unacceptable conduct in the following areas:

- Cheating, plagiarism, or falsification of records;
- Disorderly, unethical, vicious, or immoral conduct (California Administrative Code, Title 5, Education);
- Misuse, abuse, theft, or destruction of state property (California Administrative Code, Title 5, Education);
- Acts of a criminal nature involving the breaking of a civil law;
- Acts which disrupt the academic function of the college community;
- Possession of alcohol on the campus;
- Violations of college regulations and directives outlined in the *Handbook for Student Organizations*.

Suspension or expulsion will be assessed as a penalty for conduct unacceptable to the college only after the student involved has been given a formal hearing before a disciplinary board.

FRESNO STATE COLLEGE ASSOCIATION, INC.

All students enrolled at Fresno State College 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. Upon payment at registration of a \$10 fee for each student carrying seven units or more or a \$5 fee for each student carrying six units or fewer an association membership card is issued permitting him to participate in all of the activities of the association and admitting him to association activities either without charge or at a reduced admission fee determined by the Board of Directors of the Association. Membership cards are nontransferable. Faculty members are also entitled to association membership. The principal activities supported by the association fee are athletics, publications, music, drama, cultural programs, and the activities of the student government. The Board of Directors, composed of faculty members and students, is responsible for the budgetary control and management policy for all association operations which include the bookstore, cafeteria, development of the college union program, and other association activities involving expenditures of association funds.

STUDENT PUBLICATIONS

Membership in the Fresno State College Association, Inc., entitles the holder to copies of the five major student publications. The *Collegian*, published daily, is the official news publication. A handbook and a directory, appearing soon after the fall semester opens, contain general information about the college and an address list of faculty and students. The college annual, the *Campus*, appears during the final month of the college year. (To obtain a copy of the *Campus*, a reservation fee must be paid at the opening of the fall semester and membership in the association must be held both semesters or one semester plus a charge of \$2.50.) 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 organizations not only offer an opportunity for social life but also make a fine contribution to the development of student leadership.

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.

ALUMNI ASSOCIATION

Included among the purposes of the Fresno State College Alumni Association are the maintenance of contact with former students, general support of the college in all its activities, specific support of special college projects and the cultivation of an enduring loyalty to the college by its graduates. Membership is open to anyone who has attended the college for one or more semesters. Annual dues are \$6 and life memberships are \$75. Ten percent of all funds accruing to the Alumni Association from membership funds is made available as scholarships. Additional scholarship and loan funds are made available from other sources. The Alumni Association and college join in numerous events which involve students. Included are the orientation activities, homecoming, the senior breakfast at which the Alumni Association presents an award to the outstanding senior man, charter day activities, and athletic events. Each senior automatically becomes a member of the Alumni Association for one year as part of the graduation ceremony.

ESTIMATE OF EXPENSES

The basic expenses for attendance at Fresno State College for a year (two semesters) for students who live away from home will range from \$1300 to \$1700. 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 \$850 to \$1100
Materials and service fee	90
Association fee and health service fee	24
College Union Fee	18
Books and supplies	100 to 150

FACILITIES

FOOD SERVICE

The Fresno State College Association, Inc., maintains the college cafeteria, snack bar, residence hall dining room, staff dining room, and automatic food service in the Cafeteria Building. The residence hall dining room and automatic food services are open seven days per week. The Roundup, on Barstow near Maple Avenue, provides snack bar service and sells products of the college farm.

STUDENT HOUSING

College Residence Halls

The college has three modern residence halls in operation. Homan Hall houses 208 men, and Graves and Baker Halls each house 208 women. The halls are fire-proof, air-conditioned buildings having study rooms, lounges, recreation rooms, and laundry facilities. Students are housed two to a room. The rooms are attractively furnished, and provide adequate study and living facilities. Linen service is provided, but students are required to furnish their own blankets and towels. Food service is provided by the college cafeteria. For information on residence hall costs, see *Fees and Expenses*.

Each hall is under the supervision of a well qualified head resident and six student assistants. Students are encouraged to take part in group living through experience in self-government and participation in the social and intramural programs. Students living in the halls are required to observe residence hall rules. All students assigned space in residence halls will be required to sign an agreement to live in the halls for the entire college year.

Further information and applications for reservations may be obtained by writing to the Student Housing Office. Application forms should be requested prior to March 1 and will be mailed to applicants on about March 15. Students who are applying for accommodations in the halls must also file an application for admission to the college. Conditional admissions can usually be granted on the basis of a transcript of all college or high school work completed to date. For further information on admissions see *Regulations and Procedures*.

Approved Off-Campus Housing for Women

The Student Housing Office maintains a list of approved rooming and boarding houses which have been inspected and meet the college housing standards for women. A number of apartment-type units suitable for student housing have been constructed adjacent to the campus. Many of these units provide adequate supervision and meet other college standards for approved off-campus housing for women students. Fresno State College sororities also provide approved housing for women who affiliate with these organizations. Women living in approved housing will be required to observe the residence rules of the college. Arrangements for living accommodations should be made well in advance of registration. If women secure housing not on the approved list, the parent or guardian will be asked to assume full responsibility. The college strongly recommends that all freshmen women live in residence halls, sorority houses, approved off-campus housing for women, or with adult relatives. Further information on approved housing for women may be obtained from the Student Housing Office.

Off-Campus Housing

The Student Housing Office maintains a file of available student housing as a service to students seeking living accommodations. Students are advised to make arrangements for housing as early as possible before registration. Off-campus living accommodations are provided by private homes in the area, with a limited number offering room and board. A large number of apartments are available in the area adjacent to the campus. The Housing Office will also attempt to help students interested in sharing apartments to get in touch with other students interested in similar living accommodations. An international living unit located adjacent to the campus houses a number of foreign and United States students. Students interested in this type of group living should write to the Coordinator of the Foreign Student Program.

Although the college does not supervise off-campus housing, Fresno State College students living in private homes, apartments, and other types of student housing are expected to conduct themselves in a manner which will enable them to maintain desirable relations with their landlords and their neighbors.

Housing for Married Students

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

The Student Housing Office also maintains a file of privately owned rentals, some of which are near the campus. These private rentals range from \$60 to \$150 per month depending on the size and furnishings.

FINANCIAL ASSISTANCE

Scholarships and Grants

About 300 scholarships and grants totaling approximately \$68,000 will be available for the 1967-68 academic year. About half of these scholarships, ranging from \$50 to \$1,000, are open to new students. The average scholarship is for \$190 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.

Scholarships are awarded on a competitive basis, consideration being given to scholastic attainment, academic potential, financial need, character, and promise. Several scholarships are available on the basis of outstanding accomplishment in specialized fields. The purpose of the scholarship program is to provide deserving students with educational opportunities that might not otherwise be possible.

Scholarships are announced late in May of each year. Students, both entering and enrolled, should file applications with the Coordinator of Financial Aids prior to March 1st. Each applicant should present two letters of recommendation from people of recognized standing in his community who are in a position to give information about the applicant's character, ability, and financial need. The applications of new students must be accompanied by 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.

Scholarship applicants should become familiar with the yearly *Financial Aids Bulletin* which lists the various scholarships and their requirements in detail. Requests for this bulletin, for application blanks, and for other information on scholarships should be addressed to the Coordinator of Financial Aids. Students from San Joaquin Valley high schools and junior colleges may obtain information from their principals and counselors. A brochure giving information on financial aids for graduate students may be obtained from the Dean, School of Graduate Studies.

Waivers of Nonresident Fees

Certain categories of students who are not legal residents of California and would, therefore, normally be assessed a nonresident fee, may receive financial assistance in the form of waivers of part or all of this fee. (See *Schedule of Fees.*)

With verification by the Coordinator of the Foreign Student Program, students attending on *F* type visas are regularly assessed the reduced fee indicated in the *Schedule of Fees.*

With verification by the Executive Vice President, *children or spouses of California State College academic or administrative 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.*

On formal application to the Dean of the School of Graduate Studies, a limited number of *graduate students* who are not legal residents of California, but who demonstrate superior potential for master's degree study, may be granted waivers of the nonresident fee. Based on scholarship and need, these waivers are granted competitively to not more than twenty percent of nonresident graduate students. Any student accepting such a waiver is legally obligated to carry a study program of at least ten units each semester for which he receives the waiver. For information and application forms consult the Dean of the School of Graduate Studies.

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 College Association, Inc. 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 Coordinator of Financial Aids, Fresno State College, Fresno, California 93726. 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 Fresno State College Alumni Association Office on the campus. Loans granted from these loan funds may be repaid after graduation.

National Defense Student Loan Program

Fresno State College 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 to \$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 a full-time student. The first payments on these loans are required a year after the end of the nine-month grace period, and interest thereafter is to be paid at the rate of three

percent per year. *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 may have 15 percent of the loan cancelled for each year of teaching service up to 100 percent of the loan.*

Needy students with a superior academic background should consider the benefits of this program.

Inquiries should be directed to the Financial Aids Office, Fresno State College, Fresno, California 93726.

State Guaranteed Bank Loan Program

Under this program an undergraduate student may borrow up to \$1000 a year from a commercial lending institution with repayment guaranteed by the state; a graduate student may borrow up to \$1500 a year. If the family income is less than \$15,000 a year, the federal government will pay the interest during the time the student is in school carrying a full-time load, and half the interest during the repayment period. Applications for loans are available in the Financial Aids Office.

Work-Study Program

Fresno State College participates in the federal Work-Study Program as provided in the Economic Opportunities Act of 1964. Students who qualify may be offered employment.

Educational Opportunity Grants

Fresno State College participates in the Educational Opportunity Grant Program as provided in the Higher Education Act of 1965. Students who qualify will receive grants ranging from \$200 to \$800. Applications for grants may be obtained from the Financial Aids Office, Fresno State College.

State and Federal Aid to Veterans

The office of the Dean of Students maintains liaison with the Veterans Administration and the State Department of Veterans Affairs. The Coordinator 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 Coordinator 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 College 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 Coordinator 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 at least half time 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 receive a stipend of \$2,000 for the academic year. Some assistantships may be for less than half 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 Housing Coordinator.

EDUCATIONAL SERVICES

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

EXTENSION CLASSES

The college offers off-campus extension classes in regularly listed college courses when student demand is sufficiently large to finance the instruction. These courses are arranged each year in the area served by the college. *For information regarding courses, course fees, and instructional costs, write to the Dean of Educational Services and Summer Sessions.*

The college allows enrollment in 6 units of extension courses per semester as a maximum for teachers employed full time. See *Program Restrictions* for statement regarding extension classes. Not more than a total of 24 units by extension and correspondence can be applied toward a bachelor's degree. Not more than 12 units of extension and correspondence courses may be transferred from another college or university. Extension work is not entered on the Fresno State College permanent record, except at the request of a matriculated student.

Not more than 6 units of the 30 units required for the master's degree may be earned in extension courses, student teaching, transfer credit or any combination of these. When 200 series courses are taught by extension and carry the designation E after the number, they are counted as upper division courses (100 series) in master's degree programs. Candidates for the master's degree should check with the Office of the Dean, School of Graduate Studies, or departmental graduate adviser to learn whether specific extension courses may be applied on their graduate programs.

SUMMER SESSIONS

Fresno State College conducts summer sessions on its campus in Fresno, on the Bakersfield College campus, and classes on the College of the Sequoias campus in Visalia. Special workshop sessions are held in other valley centers. The Fresno and Bakersfield six-week sessions follow the spring semester; the Fresno post session follows the Fresno and Bakersfield sessions and include classes held at Visalia, Bakersfield, and elsewhere in the valley, offering the possibility of completing a maximum of 11 weeks in a single summer. Not more than one semester unit may be earned for each week of attendance, except that upon approval of appropriate college authorities additional semester units may be earned at the rate of one-half unit for each three units for which a student is registered in a three-week period. The offerings at these sessions include a variety of courses leading to the bachelor's and master's degrees. The program includes courses to meet the requirements for elementary, secondary, administration, supervision, and special credentials and in-service professional needs in various fields. Courses of a general cultural nature in various academic departments are also offered. *A bulletin describing the offerings of all sessions is ready for distribution in March. Students who are interested in attending should write to the Dean of Educational Services and Summer Sessions, Fresno State College, Fresno, California 93726.*

BAKERSFIELD CENTER

The Bakersfield Center operated by Fresno State College was established by legislative action in September 1956. The program at the center is an integral part of Fresno State College and is under the general direction of the Dean of Educational Services and Summer Sessions. It includes the recommended college program of courses leading to a bachelor's degree and elementary credential. The program is

restricted to upper division courses applicable to this degree and credential. The Center offers majors in social science and in English, and minors in art and in English to candidates for the standard teaching credential with specialization in elementary teaching.

Students who plan to attend the Bakersfield Center must apply for admission to the Director of the Bakersfield Center, Fresno State College, 4021 Mt. Vernon Avenue, Bakersfield, California 93306.

Students who plan to complete credential requirements at the Bakersfield Center must be separately admitted to the credential program. This is in addition to the general admission procedures above. For information concerning procedures for admission to a credential program and the revised credential program write to the Director of the Bakersfield Center.

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, physical therapy, theology, and veterinary medicine. Certain of these programs are described below. Students should consult an adviser and the catalog of the school of their choice. Students planning to complete a preprofessional program and degree at Fresno State College must enroll in a major offered at this college.

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) to make a total of 60 units. Each science course must include laboratory.

The trend among dental schools is to require more than two years of predental training including a broad liberal arts background. Additional science courses recommended or required include a year course of organic chemistry instead of one semester, quantitative chemical analysis, elementary physical chemistry, other zoology courses, and in some cases a foreign language. Several schools require a bachelor's degree for entrance. The applicant is usually required to take the American Dental Association aptitude test and present evidence of physical fitness and good moral character. 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. It is, therefore, advisable for students preparing for law to arrange a four-year program leading to a bachelor's degree. Law schools recommend a prelegal program which gives a broad cultural background; any baccalaureate major may be chosen from the college offerings (see list under *Degree Majors and Minors*). The prelegal student should choose the major most interesting to him. 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 two modern foreign languages is a requirement for admission to most graduate schools of librarianship; this requirement is normally satisfied by the successful completion of one college year in each of the languages. Students considering librarianship as a career should consult the prelibrary program adviser in the Library.

PREMEDICAL

Medical colleges vary widely in their specific requirements for admission. All medical schools require completion of three years of college (a minimum of 90 semester units) with a C average or better. A program which includes 38 semester

units of natural science distributed in biology (12 units), chemistry (18), and physics (8), one year of English, including composition, and a reading knowledge of a modern foreign language will qualify a student for most medical schools. The applicant is usually required to take the medical aptitude test and to present evidence of physical fitness and moral character. Due to competition for admission to medical schools the majority of students find it necessary to complete the four-year program for the bachelor's degree and to achieve a grade average of better than C.

Each student embarking on a premedical course at Fresno State College will be assigned to a member of the premedical advisory committee who will assist him in planning his course and will maintain close contact with him during the first year. During this period, screening tests are available to aid in ascertaining fields in which the student possesses the greatest interest, achievement, and aptitude. By the beginning of the sophomore year the student will be expected to select his major, and will be assigned to an adviser qualified to guide him in his field of concentration.

Although the premedical requirements include a minimum of 38 units of natural science, it does not follow that the premedical student must load his program with many additional units in the sciences. In fact, a student who has particular aptitude and interest in the social sciences or humanities may well elect his major in one of these fields, and still be able to meet the premedical requirements quite satisfactorily. The medical schools continue to report that they do not expect entering students to be finished technicians, but that they are more concerned with a good record in the specific science requirements, evidence of a well-balanced liberal education, and the ability to adapt to the rigid disciplines of medicine.

The college, through its premedical advisory committee, will make every effort to guide the student through the premedical course successfully, and will endeavor to assist those who have demonstrated suitability for the study of medicine to gain admission to the medical school of their choice. The committee, when requested, will submit its appraisal of each student to the medical schools to which the student applies for admission.

PRETHEOLOGICAL

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 for graduate study suggests 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 courses such as Phil 142, Psych 141, Rel 20, 120, 182, or 183. Additional courses are advised for students interested in religious education. 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 Ag 1, AH 1, 2, 71, Biol 1A, Chem 1A-B, 8, 105, Phys 2A-B, Zool 1, 103, 160. The School of Agriculture 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 Dean of the School of Agriculture.

DEGREES AND CREDENTIALS

GENERAL REGULATIONS

Fresno State College is authorized to grant the bachelor of arts, bachelor of science, bachelor of education, bachelor of vocational education, master of arts, master of science, master of business administration, and master of social work degrees. Public school credentials for which the college is authorized to recommend candidates are listed at the end of this section.

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.

APPLICATION FOR DEGREE OR CREDENTIAL

Application for degree or credential must be obtained and filed in the Evaluations Office at the beginning of the semester or summer session term during which the candidate expects to complete requirements. Dates and deadlines for filing applications are listed in the *College Calendar*. All applications for degrees or credentials filed after the published dates incur a fine of \$2; failure to make application before the final deadline will delay the granting of the degree or credential. Diplomas for those completing degree requirements during summer sessions and the fall semester will be awarded at the following June commencement exercise. See *Fees and Expenses*.

POST-BACCALAUREATE CREDIT

Effective fall 1966, upper division units earned at Fresno State College in the semester or summer session in which the bachelor's degree is granted but which are not needed in any way for such a degree will be listed on the student's record as *post-baccalaureate credit* provided the student, at the beginning of the final semester, is in good academic standing (not on academic probation). 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. If any units of a course are needed for the baccalaureate program, the entire course will be so counted.

Use of such credit for graduate degrees at Fresno State College 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. Other students, following the completion of approximately 60 semester units, should file a request for an advanced standing evaluation at the Evaluations Office. Upon completion of approximately 90 semester units, a student should request a degree evaluation 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 and keep them for his personal file and for any other purpose for which they may be needed.

ELECTION OF REGULATIONS

A student by remaining in continuous attendance in regular sessions may, for purposes of meeting graduation requirements, elect to meet the graduation requirements in effect either at the time of his entering or at the time of his graduation. 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 College; 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 College 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 limitation on credit by extension and correspondence, see *Extension Classes*.

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 College, and must have at least a C average in his approved major.

See also *School of Education—Application for Admission to Credential Programs* and *School of Graduate Studies*.

SPECIAL COURSE REQUIREMENTS

Entering undergraduate students should note the following specific requirements:

Physical Education Activities (PE M, C, or W series. These were formerly the 10, 40, 50 series.) 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 medical excuse from the college physician, or who are 25 years of age or older. Requests for this waiver or any deviation in meeting the requirement must be submitted to the Dean of Students Office. Basic air science (4 semesters) may be substituted for the physical education requirement. See *General Education Requirements*.

Elementary Algebra and Plane Geometry are required for graduation, if they have not been completed in high school. See *Mathematics Department—Duplication of Courses*.

FOREIGN LANGUAGE REQUIREMENT

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

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.
2. Students who have high school credit or other experience in a foreign language and who wish to continue in the same language are required to take a foreign language placement test before enrolling in a foreign language class. Normally students beginning a new language will enroll in the 1A class. College credit may be earned in the class in which the student is placed. (See *Credit Allowance in Foreign Language*.)

Successful completion of a 2B foreign language course will be accepted as fulfillment of the foreign language requirement. Students taking the foreign language placement test and placing beyond the 2B level will be certified as having met the foreign language requirement. Consult the *Schedule of Courses* for dates of placement tests.

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 that, in addition to his field of specialization, each student shall have an opportunity to prepare for the broad responsibilities society expects a college graduate to accept. Toward this end, the general education program places particular emphasis on those kinds of knowledge and understanding which a liberal arts institution of higher education is especially equipped to provide.

The *California Administrative Code Title 5* provides for a minimum of 45 units of General Education, with 31 specified units and 14 units distributed by the college. Fresno State College interprets this requirement as outlined in this section for degree programs. (See *School of Education* for information on somewhat different and additional general education requirements for credentials.)

Selection of Courses

Students are urged to consider their selections carefully to complement the major in such a way as to produce a well-rounded degree program. In the interest of a balanced general education, not more than two semester courses should be selected from any one subject field (e.g., botany, chemistry, history, literature, mathematics, sociology, zoology).

In the event of a difference between the number of units used to meet a requirement and the number of units specified for that requirement, this difference may be absorbed in Requirement 7 if there is an appropriate category.

General education requirements are in addition to degree major requirements; no units counted as part of a student's degree major may also be counted as part of his 45 units of general education. Appropriate general education courses may be used toward completion of a minor or toward "Additional Requirements" beyond the degree major.

GENERAL EDUCATION REQUIREMENTS

The statements in *italics* define the intent of the program. Courses at Fresno State College acceptable to meet this intent are listed below; approved transfer courses will also be accepted. A minimum of 45 semester units is required.

- | | <i>Units</i> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1. SOCIAL SCIENCE | 9 |
| <i>To include at least one course from the area of man and culture and provide for meeting the requirement in American history and federal, state, and local government.</i> | |
| SELECT ONE FROM EACH GROUP: | |
| Man and Culture: Hist 1, 2, 7, Anthro 2, Geog 3, 4, Soc 1A. | |
| American History: Hist 11, 12, 171, 172, 173, 174. | |
| American Government: Pol Sc 11, 1A-B, 101. | |
| 2. NATURAL SCIENCE | 9 |
| <i>To include at least one basic concept course in life science and one in physical science. See course descriptions for possible restrictions on combinations of courses.</i> | |
| SELECT AT LEAST ONE FROM EACH GROUP: | |
| Physical Science: Phys Sc 10, 12, Physics 2A, 4A, Chem 1A, 2A, Geol 1, 1L. | |
| Biological Science: Biol 1A, 1B, 2A, Bot 1, Zool 1. | |
| SELECT ADDITIONAL SCIENCE (if needed to complete units): | |
| Physics 2B, 4B, 4C, 55, Chem 1B, 2B, 8, Geog 5, Biol 2B, Physio 1, Phys Sc 21. | |
| 3. LITERATURE, PHILOSOPHY, AND THE ARTS | 6 |
| <i>To include an introduction to literature, philosophy, or logic (three units) and one or more courses providing experience in or acquaintance with creative expression in the arts.</i> | |
| SELECT ONE (THREE UNITS) FROM LITERATURE, PHILOSOPHY, OR LOGIC: | |
| Engl 20. | |
| Phil 20, 22, 23, 25, 52, 53. | |
| SELECT THREE UNITS FROM THE FOLLOWING ARTS: | |
| Art 3, 4, 11, 119, 144. | |
| Mus 19, 1 or 101, 76T, 176T. | |
| Phil 110. | |
| Drama 62, 184, 185A, 185B, R-TV 128, Spch 22, 122. | |
| IA 133, 146, 162, 177, 179. | |
| PE 63 or 163, C116, C117, C118. | |
| 4. HEALTH AND PHYSICAL EDUCATION | 3 |
| <i>To include physical education activity and to meet the mental and physical health requirements. The college requires four semesters of physical education; two units apply here. See Special Course Requirements.</i> | |
| SELECT FOUR SEMESTERS (TWO UNITS APPLY HEKE) PE M, C, W, series. | |
| SELECT ONE: H Sc 90, 91. | |
| 5. ORAL AND WRITTEN ENGLISH | 6 |
| <i>To be equally divided between oral and written English.</i> | |
| REQUIRED: Spch 21. | |
| SELECT ONE: Engl 1, 40T. | |
| 6. PSYCHOLOGY | 3 |
| <i>To include an introduction to psychology.</i> | |
| SELECT ONE: Psych 7, 10. | |
| 7. ADDITIONAL UNITS OUTSIDE MAJOR FIELD TO COMPLETE TOTAL OF 45 UNITS | 9 |
| <i>To be distributed among categories listed below; to include at least two categories; and to consist of courses which have broad scope, relate fields of study, or provide widely applicable theory.</i> | |

SELECT FROM AT LEAST TWO CATEGORIES:

(Courses listed in Requirements 1-6 above may be used in the appropriate section of Requirement 7, provided the same units are not applied in both places.)

FOREIGN LANGUAGE: Any courses in foreign language.

HUMANITIES: Engl 50T, 134, 138, 159T, 169T, Phil 102, Rel 20 or 120, 182, 183, courses listed in English and Philosophy in Requirement 3.

MATHEMATICS: Math 29, 30, 40, 51, 71, 72, 75, 76, 103, 140.

NATURAL SCIENCES: Biol 173, Geol 2, courses listed in Requirement 2.

SOCIAL SCIENCES: Econ 1A, 1B, 110, Geog 116, 177, Hist 3, 176, 177, 181, Soc 1B, 111, courses listed in Requirement 1.

ARTS: Courses listed in Requirement 3.

PSYCHOLOGY, JOURNALISM, BUSINESS, HOME ECONOMICS, SPEECH ARTS, AGRICULTURE: Psych 145, Jour 104, 150, Bus Ad 8, 10, H Ec 42, 131, PAC (formerly Spch) 121, 170, 171, Vit 15.

BACHELOR OF ARTS DEGREE

For the bachelor of arts degree a minimum of 124 semester units must be completed and must include at least 40 upper division units. Upper division courses taken before the student has earned 45 units may not be applied on this 40-unit requirement.

The general degree requirements, general education requirements, and one major must be satisfactorily completed; see *Degree Majors and Minors*. Units used to meet the general education requirements may not apply on the degree major. If a second concurrent major is desired, courses acceptable for satisfaction of general education requirements for the first major may be used to satisfy second major requirements. 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. While a minor is not required for graduation, students are encouraged to study the minor offerings of the various departments and consult their advisers to determine whether one or more minors would be an appropriate complement to their college programs. A graduating senior may request that the completion of any minor listed by a department be recorded on his transcript.

BACHELOR OF SCIENCE DEGREE

For the bachelor of science degree, a minimum of 124 to 136 semester units depending on the major field must be completed. The general degree requirements, general education requirements, and one major must be satisfactorily completed, see *Degree Majors and Minors*. Courses used to meet the general education requirement may not apply on the major. If a second major is taken concurrently or consecutively, courses acceptable for satisfaction of general education requirements for the first major may be used to satisfy second major requirements.

BACHELOR OF EDUCATION DEGREE

(See *School of Education*)

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 MAJORS AND MINORS

Fresno State College offers majors as indicated below for the bachelor of arts (BA), bachelor of science (BS), bachelor of vocational education (BVEd), master of arts (MA), master of science (MS), master of business administration (MBA), and master of social work (MSW) degrees. A major for a degree consists of an approved program of courses designed to give depth in a principal subject or discipline. Requirements for approved undergraduate majors are listed in the appropriate department or school sections of the *General Catalog*. When selections are made within the major, these choices must have departmental approval. See *Graduate Bulletin* for master's degree programs.

Minors are also offered in the areas listed below with the exception of those marked with an asterisk (*). For requirements see departments concerned.

Accounting *	BS	Industrial arts	BA, BVEd, MA
Aerospace studies	minor only	Industrial engineering *	BS
Agribusiness *	BS	Industrial technology *	BS
agricultural mechanics, animal science, business, plant science		automotive, drafting, electrical, graphic arts, metal, wood	
Agricultural engineering *	BS	Journalism	BA
Agriculture	BS, MS	Latin	minor only
agricultural inspection and services, agricultural mechanics, agricultural science (animal science, plant science), agronomy, animal husbandry, dairy science (dairy husbandry, dairy industry), general agriculture, horticulture, ornamental horticulture, poultry husbandry, viticulture and enology (enology, viticulture)		Latin-American studies *	BA
Anthropology	BA	Linguistics *	MA
Art	BA, MA	Marketing *	BS
Biology	BA, BS, MA	Mathematics	BA, BS, MA, MS
Botany *	BA	Mechanical engineering *	BS
(see Biology MA)		Microbiology *	BA
Business	MS	(see Biology MA)	
Business administration *	BS, MBA	Music	BA, MA
Chemistry	BA, BS, MS	Nursing *	BS
Civil engineering *	BS	Office administration *	BS
Criminology *	BS, MS	Philosophy	BA
corrections, law enforcement		Philosophy-psychology *	BA
Dramatic art	BA	Physical education—men	BA, MA
(see Speech MA)		Physical education—women	BA, MA
Economics	BA, MA	Physical science	minor only
Education *	BA, MA	Physics	BA, BS, MA, MS
Electrical and electronics engineering *	BS	Political science	BA, MA
English	BA, MA	Psychology	BA, MA
Foreign language *	MA	Public administration	BA
French, German, Spanish		(see Political science MA)	
French	BA	Radio-television broadcasting	BA
(see Foreign language MA)		(see Speech MA)	
Geography	BA, MA	Recreation	BS
Geology	BA, BS	Russian	BA
German	BA	Social science *	BA
(see Foreign language MA)		Social welfare *	BA
Health science	BA	Social work *	MSW
health and safety, public health, sanitation (see Education MA)		Sociology	BA
History	BA, MA	Spanish	BA
Home economics	BA, MS	(see Foreign language MA)	
		Special *	BA
		(see below)	
		Speech	BA, MA
		public address-communication, speech correction-audiology	
		Zoology *	BA
		(see Biology MA)	

Special Major. A student may propose a program of correlated studies in two or more fields for a special major. This program must be based on a minimum of 24 units of which 12 are upper division and have the approval of the chairmen of the departments concerned and the Academic Vice President.

PUBLIC SCHOOL CREDENTIALS

Fresno State College is authorized by the State Board of Education to recommend candidates for public school service credentials in elementary and secondary teaching, 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 College to qualify for a college 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 College 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*.

The revised credential structure under the *Licensing of Certificated Personnel Law of 1961*, effective January 1, 1964, reduces the number of public school credentials to five basic types (*California Education Code, Section 13187*). Candidates for a standard teaching credential must complete major and minor requirements in accordance with one of the options listed below. For a detailed outline of major-minor options, see *School of Education—Major and Minor Requirements for Standard Teaching Credentials*.

1. A major in an academic subject matter area commonly taught in the public schools.
2. A major and a minor, each of which is in a subject matter area commonly taught in the public schools, and one of which is in an academic subject matter area. Specialized preparation may be substituted for the minor when the major is in an academic subject matter area.
3. Two minors in subject matter areas commonly taught in the public schools and a major, other than education and educational methodology, not commonly taught therein. If the major is not in an academic subject matter area, each minor shall be in an academic subject matter area. If the major is in an academic subject matter area, one of the minors shall be in an academic subject matter area. Specialized preparation may be substituted for one of the minors.

The *California Education Code, Section 13188*, presently defines academic subject matter areas as the natural sciences, the social sciences, the humanities, mathematics, and the fine arts. To determine whether a proposed major or minor field is included within the requirement that it be commonly taught in the public schools, consult the school or department in which the subject is offered.

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

- The Standard Teaching Credential With a Specialization in Elementary Teaching, Secondary Teaching, or Junior College Teaching.
- The Standard Designated Subjects Teaching Credential.
- The Standard Designated Services Credential.
- The Standard Supervision Credential.
- The Standard Administration Credential.

SCHOOL OF GRADUATE STUDIES

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SCHOOL OF GRADUATE STUDIES

Phyllis Welch Watts, Dean

The School of Graduate Studies embraces all graduate programs and activities in the college, including programs leading to the master of arts degree in 17 fields, the master of science degree in 7 fields, the master of business administration, and the master of social work. 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 Dean, School of Graduate Studies, Fresno State College.

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 College is authorized to grant the master's degrees listed below.

Agriculture, MS	Home Economics, MS
Art, MA	History, MA
Biology, MA	Industrial Arts, MA
Business, MBA, MS	Linguistics, MA
Chemistry, MS	Mathematics, MA, MS
Criminology, MS	Music, MA
Economics, MA	Physical Education, MA
Education, MA	Physics, MA, MS
English, MA	Political Science, MA
Foreign Language, MA (French, German, Spanish)	Psychology, MA
Geography, MA	Social Work, MSW
	Speech, MA

INTERNATIONAL STUDY PROGRAMS

(See *Special Programs*)

FOREIGN GRADUATE STUDENTS

Fully qualified graduate students coming to Fresno State College with the ultimate goal of a master's degree should allow approximately two years for accomplishing this objective. Graduate students regularly devote most of their time to studies in their major field; however, students from abroad whose native language is not English and who are studying in this country for the first time, are expected to enroll in International Studies 293 during the first semester at Fresno State College and 295 during the last semester. Both courses apply toward degrees. For further information, see *International Study Programs—Graduate Courses*.

Depending on the quality of his work in the first semester and his ultimate purpose, the 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 College 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 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.

UNCLASSIFIED GRADUATE STANDING

A student who holds a bachelor's degree may be admitted to unclassified graduate standing according to the appropriate procedure listed below. This status permits him to enroll in courses for which he has the prerequisites. (See *Course Numbering System—Eligibility and Definitions* and individual course descriptions.)

1. *A graduate of Fresno State College 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 College 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 College, 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.

MASTER'S DEGREES

To be eligible to receive the master's degree at Fresno State College 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*.

GENERAL REGULATIONS

Applicants for all master's degrees are admitted to graduate standing, programmed, and advanced to candidacy under the same college-wide policies. Most departments, however, impose additional requirements for admission to specific programs, advancement, and completion.

CLASSIFIED GRADUATE STANDING

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*. Normally instructions for achieving classified status are mailed by the Dean, School of Graduate Studies to admitted students who have indicated degree objectives. Any degree aspirant who does not receive instruction in the mail is invited to come or write to the Dean, School of Graduate Studies for this material prior to consulting an adviser.

Not more than 10 units (including transfer credit) completed before achieving classified standing at Fresno State College 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 10 units must be completed after advancement. Requirements for advancement to candidacy include the following:

1. Classified graduate standing.
2. Completion of any undergraduate prerequisites which the adviser specifies on the declaration of intent form.
3. Satisfactory completion of a scholastic aptitude test for graduates and such departmental and scholastic achievement tests as may be required. (See *Examinations*.)
4. A minimum grade point average of 3.0 (both over-all and at Fresno State College) 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. Approval by the appropriate departmental graduate committee. Ordinarily upon receipt of examination scores the Dean, School of Graduate Studies, sends to the department committee a transcript and a report of grades and examination scores and requests departmental recommendation. 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. A student who does not qualify at this time has the responsibility for initiating the procedure in the Office of the Dean, School of Graduate Studies, when he has removed deficiencies.
6. Satisfactory completion of the foreign language requirement for those programs having such a requirement. (See departmental *Foreign Language Requirement*.)
7. Completion at Fresno State College of at least 9 units of the proposed program with a 3.0 average on all completed work appearing on the program.
8. As soon as possible after the completion of steps 1 through 7, submission to the Office of the Dean, School of Graduate Studies, of a properly signed petition for advancement to candidacy, including a departmentally approved contract program of graduate study for the master's degree.

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 and MSW minima.)

The contract program for the master's degree is a coherent pattern of (1) courses specified for an approved field of concentration 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. Only in individual cases and subject to departmental approval, may 300 series courses be applied toward unit requirements of master's degree programs. 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 contract program must include the following:

1. At least 24 units of the program must be Fresno State College 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, extension courses, or transfer credit. 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. 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.
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 12 units must be in courses designed primarily for master's degrees (numbered in the 200 series). Most programs require more than 12 units of 200 series course work.
5. At least 10 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, a seminar alternative.

It is the student's responsibility to complete the specific courses listed on his contract program. Once a contract 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 Office of the Dean, School of Graduate Studies. Forms for requesting such program adjustment are available in the Office of the Dean, School of Graduate Studies.

THESIS, PROJECT, AND THESIS ALTERNATIVE

Most master's degree curricula at Fresno State College 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), a student must have
 - (a) been advanced to candidacy for the master's degree.
 - (b) maintained a B (3.0) average on his contract program.
 - (c) completed at least six units of his contract 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.
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. 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 *Regulations and Procedures—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 *Regulations and Procedures—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 the specifications for the master's thesis, copies of which are available in the Office of the Dean, 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 Dean, 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. (See *Schedule of Fees.*)
 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 Dean, School of Graduate Studies.

APPLICATION FOR MASTER'S DEGREE

An application for the master's degree must be filed in the Office of the Dean, School of Graduate Studies, in the first two weeks of a semester or first week of a summer session in which the work is to be completed. (For dates see *College Calendar* or *Schedule of Courses*; see also *Schedule of Fees*.)

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.

FOREIGN LANGUAGE REQUIREMENT

Fresno State College does not have a general foreign language requirement for the master's degree. Some specific 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

Students are warned that graduate courses require substantially more concentrated study than do undergraduate 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 *Regulations and Procedures*.

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

To be eligible for advancement to candidacy, a student must have earned a B average (both overall and at Fresno State College) 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 a seminar alternative to the thesis, a student must have been advanced to candidacy and must have maintained a B average on his contract program.

To be eligible for the granting of the degree, a student must have maintained a B average on his complete contract program. Any grade earned in a course on the contract 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 contract program for the master's degree or on all upper division and graduate work subsequent to the bachelor's degree. He must also be nominated by his department.

EXAMINATIONS

The Graduate Record Examination Aptitude Test (or the Admission Test for Graduate Study in Business) is required for classified standing. Preferably it should be taken prior to enrollment, but special arrangements may be made to meet the requirement. 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 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 Dean, School of Graduate Studies for a descriptive brochure and application forms.

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COURSES OF INSTRUCTION

ORGANIZATION

For administrative purposes the 35 departments of the college are organized in 6 schools and a division, which operates as a school. The following section on courses of instruction is arranged alphabetically by schools and, where appropriate within schools, alphabetically by department and course designation. These are listed below. At the beginning of the section on a school or department there is a statement of the requirements for completion of major, minor, and other programs, followed by descriptions of all courses of instruction offered as part of the regular program of the college. The listed names of faculty members are those for the 1966-67 academic year.

School of Agriculture

Agriculture
Agricultural Mechanics Department
Animal Science Department
 Animal Husbandry
 Dairy Science
 Poultry Husbandry
Plant Science Department
 Agronomy (Crop Production)
 Horticulture
 Ornamental Horticulture
 Viticulture and Enology

School of Arts and Sciences

Anthropology-Sociology Department
Art Department
Biology Department
 Bacteriology
 Biology
 Botany
 Entomology
 Physiology
 Zoology
Chemistry Department
Economics Department
English Department
Foreign Language Department
 Foreign Language
 French
 German
 Italian
 Latin
 Portuguese
 Russian
 Spanish
Geography Department
Geology Department
History Department
Mathematics Department
Music Department
Philosophy Department

Physical Education and Recreation
 Department
 Physical Education
 Recreation
Physical Science
Physics Department
Political Science Department
Psychology Department
Social Science
Speech Arts Department

School of Business

Accounting
Business
Business Administration
Marketing
Office Administration
Accounting and Quantitative
 Studies Department
Finance and Industry Department
Management and Marketing
 Department
Office Administration Department

School of Education

Elementary Education Department
Secondary Education Department
Advanced Studies Department

School of Engineering

School of Professional Studies

Aerospace Studies Department
Criminology Department
Health Science Department
Home Economics Department
Industrial Arts and Technology
 Department
Journalism Department
Nursing Department

Division of Social Work

COURSE NUMBERING SYSTEM**DEFINITIONS AND ELIGIBILITY****Lower Division Courses**

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

Upper Division Courses

Numbers 100-199 designate *upper division (ud) courses* designated for third-, fourth-, and fifth-year students. Such courses will count as graduate work when taken by students who have graduate status but require departmental approval for use on a master's degree program (also see *Post-Baccalaureate Credit*). Freshmen and first-semester sophomores are not normally eligible for upper division courses; but second-semester sophomores who have completed a minimum of 45 units are permitted to enroll in the upper division courses for which they have adequate preparation. Course number 190 designates independent study. See *Regulations and Procedures* and specific course prerequisites.

Graduate Courses

Numbers 100G-199G designate courses which combine and intensify material normally offered in undergraduate courses. Designed for use in the first year of two-year master's degree programs, these courses are open only to graduate students.

Numbers 200-299 designate *graduate courses* designed for use on masters' degree programs. They are open only to holders of bachelor's degrees and to second-semester seniors with superior preparation and ability who are admitted by the instructor to bachelor's degree holders with adequate preparation and ability. Courses in the 200 series are generally conducted as seminars, requiring original research; some are lectures based upon instructors' research; all involve originality, initiative, and independence of judgment. Course number 290 designates *independent study* at the graduate level; 299 a master's degree thesis or project. See *Regulations and Procedures; Degrees and Credentials*; and specific course prerequisites.

When 200 series courses are taught by extension and carry the designation E after the number, they are counted as upper division courses (100 series) in master's degree programs. For limitation of credit in these courses, see *Extension Classes*.

Numbers 300-399 designate courses whose purpose is to meet professional needs which cannot be served by established undergraduate or graduate offerings. These courses assume completion of the bachelor's degree and professional competence and focus on current problems of enrolled students in their professional service. Although 300 series courses are designed primarily for purposes other than use on degrees and credentials, in individual cases and subject to prior departmental approval, they may be applied toward degree or credential programs for which the course work is appropriate. If applied on credential programs, the approval of the Dean of the School of Education is also required. Titles appear in the *General Catalog*; descriptions appear only in appropriate *Extension* and *Summer Session Bulletins*.

OTHER DESIGNATIONS

For *symbols* appearing after course numbers, A-B indicates a two-semester sequence normally to be taken in order; A and B courses which may be taken independently are normally listed as separate items. The following symbols usually indicate: L, a laboratory for another course; F, a field course; E, an extension course; S, a course listed only in the *Summer Session Bulletin*; G, an intensified 100 series course limited to graduate students; HD, a departmental honors course; HC, a general college honors colloquium. The letter T indicates a topics course

which can have varying subject matter within an area, usually repeatable for credit. The generic title only is given in the catalog; the specific title applicable to each offering of the course appears in the *Schedule of Courses* and on the student's transcript.

Figures in parentheses following course titles indicate the number of semester units a course carries, and the maximum total credit allowed is indicated by *max total* following the number of units. In general, each unit represents one hour per week in class and two hours in preparation. Courses involving laboratory, activity, or other application, normally require additional hours of class attendance. Lecture, laboratory hours, etc., following course descriptions indicate deviation from the usual one class hour per week for each unit of credit. Under special circumstances, courses may be offered with reduced unit value with approval of the Academic Vice President.

Course *prerequisites* are listed at the beginning of the course description and under *Definitions and Eligibility* above. Unless otherwise stated, the A part is prerequisite to the B part of year courses. Student should check prerequisites before enrolling.

Course offerings for each semester are listed in the *Schedule of Courses*.

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SPECIAL 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.

EXPERIMENTAL COLLEGE

Within Fresno State College the Experimental College is designed to permit educational experimentation under circumstances not feasible under standard procedures. It encourages the development of kinds of learning which may involve departures from usual patterns in methods of instruction and scheduling, unit allocations, discipline boundaries, and relations between students and instructors.

The program is under the supervision of an Experimental College Committee composed of equal numbers of students and faculty. Courses instituted under it may not so 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, or by students. Decisions of the committee are normally based on recommendations from departments or schools and from other knowledgeable sources. The committee gives priority to those proposals which appear to have the greatest merit as potential contributions to the total program of the college but 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 numbers preceded by X. They are not described in this catalog until permanently accepted. A special bulletin published each semester provides course descriptions and other information concerning the program.

HONORS PROGRAM

The honors program is designed to serve superior undergraduate students by encouraging intensive scholarship and creative abilities. Particular stress is given to developing the student's capacity for independent pursuit of knowledge and dedicated commitment to scholarship. The honors program is open by invitation of the college to all qualified undergraduates. Invitations to participate in the program are extended on the basis of proven capacity for outstanding academic performance as indicated by faculty recommendations, scholastic record, and entrance test scores. Students who complete the requirements outlined below are eligible for special recognition at graduation, with general college honors, departmental honors, or both.

The *general college honors program* provides study in a series of specially designed colloquia which are broad in scope and may be interdepartmental. Lower division general college honors colloquia require no prerequisites other than admission to and satisfactory standing in the honors program; upper division general college honors colloquia prerequisites are generally determined by the department or departments offering the course. To graduate with general college honors a

student must satisfactorily complete a minimum of 12 units of honors work (of which no more than three can be in departmental honors), successfully complete an honors paper or project, and pass a short oral examination. No later than the beginning of the second week of classes of the semester in which the student expects to graduate with college honors, and preferably well in advance of this time, he must submit to the College Honors Program Coordinator a written prospectus of not more than one hundred words describing the honors paper or project which he intends to submit to fulfill this requirement. The student should not choose a topic which focuses primarily within his major field. Completed papers must be in the hands of the Honors Program Committee chairman by November 20 if the student expects to graduate in mid-year, and by April 1 if he expects to graduate in June.

The *departmental honors program* provides specialization beyond the normal undergraduate requirements in a major field. Departmental honors programs and requirements vary from department to department. Consult department for further information.

The subject matter and course titles of general college honors colloquia and departmental honors courses vary from semester to semester. See the *Schedule of Courses* for offerings in any particular semester; also see section on *Courses of Instruction—Honors Courses*.

COURSES

The subject matter and course titles of departmental honors courses and general college honors colloquia vary from semester to semester. For the offering in any particular semester see the *Schedule of Courses*. Honors courses are designated by HD or HC preceding the course number. HD indicates a departmental honors course; HC, a general college honors colloquium. Enrollment in honors courses is by invitation. (See *Regulations and Procedures—Honors Program*.)

Departmental Honors Courses Offered 1966–1967

Hist HD 1. Western Civilization to 1650 (3)

Honors section of Hist 1.

Hist HD 2. Western Civilization Since 1650 (3)

Honors section of Pol Sc 11.

Pol Sc HD 11. American Government and Institutions (3)

Honors section of Pol Sc 11.

General College Honors Colloquia Offered 1966–1967

(Ag) HC 170. World Food Problems (3)

Analysis of world food problems, evaluation of possible solutions on the basis of population growth, distribution, and control; food resources, natural and artificial; role of technology; political and social implications; organizations working on these problems.

(Engl) HC 170. Visions of Technology (3)

Radical conflicts in American culture due to rapid expansion of modern technology; dilemmas of power and factors of change inherent in "the machine" as reflected dramatically in American literature and folklore.

(English) HC 170. The Hero in Modern Literature (3)

An examination of 19th and 20th century literature dealing with the genesis and evolution of the *New Hero* or *Anti-Hero*.

(F Lang-Mus) HC 170. Poetry and Music (3)

Analytic study of the poetry of Goethe, Schiller, Heine, Uhland, Mörike, Eichendorff and others as set to music by Schubert, Schumann, Wolf, Beethoven, Brahms, and others. Recital performances.

(Hist) HC 170. The Religious Factor in American History (3)

Changing preoccupations and styles of American theological expression; institutional changes; innovations in religious expression; relation between movements of religious enthusiasm and movements of social concern; changing patterns of Church-State relationships against the background of American political, social, and intellectual history.

(Phil) HC 170. Field Studies in Comparative Religion (3)

Analysis and comparison of answers to basic religious questions raised by Buddhism, Islam, Christianity, Judaism, and other religions having active Fresno-area groups; research in depth (field trips, interviews of local religious leaders).

(Psych) HC 170. Special Readings: Classics in Psychology (3)

Examination of original writings basic to understanding of nineteenth and twentieth century psychology.

Psych HC 170. Creativity (3)

Understanding of and training in creative processes by direct participation in applying the principles and techniques of creative functions to modes of thinking and everyday living.

INTERNATIONAL STUDY 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 Colleges offer an overseas program which provides an opportunity for American students to study abroad.

CAMPUS PROGRAM

The International Study Campus Program is not expected to be in full operation until the summer of 1968. This program 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 Regulations and Procedures—Entrance Examinations) All foreign students should, therefore, make application early enough so that they can attend the summer orientation program if they are admitted to the college and are not excused from that part of the program. After arrival at the college, examinations and an interview may lead to the students being excused from certain courses. Grading on a "pass-withdraw" basis will be characteristic in the lower division courses. (See *Regulations and Procedures—Pass-Withdraw Grading*).

Summer Orientation Program: An eight-week program, to terminate about September 1, consists of intensive work in the English language and a general orientation to American society. It consists of IS 1, 2, and 3 as described below. This orientation program does not yield college credit.

First Fall Semester Program: Successful completion or waiver of the Summer Orientation Program will lead to enrollment in IS 10, 21, and 193 in the fall semester. With permission of his adviser, a student may enroll in other regular courses.

Other Undergraduate Courses: Two other English language courses, IS 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 IS 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, including the Summer Orientation, when considered necessary by his advisers. Application for admission should be made early enough to permit attendance at the Summer Orientation Program, if it is required. Graduate students may elect to take IS 193, but will be expected to enroll in IS 293 and 295.

COURSES

IS 1. Oral English (no credit)

The phonemic contrasts, stress, and intonation of American English. Sentence pattern drills. Offered in summer only.

IS 2. Reading and Composition for Foreign Students (no credit)

Practice in reading for comprehension, vocabulary development, and speed. Short compositions, spoken and written, based on reading assignments. Offered in summer only.

IS 3. Orientation to American Society (no credit)

Examination of American customs and institutions designed to give the foreign student familiarity with and deeper insight into his new environment. Includes sections on social relations, the family, the community, the arts, religion, education, government, and the economy.

IS 10. English Composition for Foreign Students (3)

Meets English composition requirement for general education. Study and practice of complex sentence types, including embedding, permutation, expansion, etc. Vocabulary development; critical reading; paragraph and essay composition.

IS 21. Introduction to Public Speaking for Foreign Students (3)

Meets speech requirement for general education. Advanced drills in articulation, intonation, rhythm, and word and sentence stress. Speech composition including organization, delivery, and support.

IS 110. Advanced Composition for Foreign Students (3)

Research techniques; rhetorical theory; critical reading.

IS 121. Advanced Public Speaking for Foreign Students (3)

Advanced practice in expository and persuasive speaking. Analysis of propaganda. Study of techniques of persuasion; group discussion.

IS 193. Introduction to American Culture (3)

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).

IS 195. Interpretation and Analysis (3)

Open only to undergraduate students from abroad. 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**IS 293. Contemporary America (3)**

Open only to students from abroad. Prerequisite: graduate standing or 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*.)

IS 295. Interpretation and Analysis (3)

Open only to graduate students from abroad. 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*.)

OVERSEAS PROGRAM

The California State Colleges offer academic year programs of study at a number of distinguished universities abroad. In 1967-68 the cooperating universities are: University of Aix-Marseille, France; Free University of Berlin and University of Heidelberg, Germany; University of Florence, Italy; Waseda University, Tokyo, Japan; University of Granada and University of Madrid, Spain; University of Stockholm and University of Uppsala, Sweden; National University, Taiwan. Academic work successfully completed at the cooperating universities abroad may be applied toward the degree requirements of the college in accordance with college regulations with a maximum of thirty units for two semesters.

A selection among applicants from all California State Colleges is made on the basis of academic, linguistic, and personal qualifications. The criteria are:

- (a) Upper division or graduate standing by the beginning of the academic year abroad;
- (b) Academic achievement;
- (c) Proficiency in the language of instruction;
- (d) Faculty recommendations.

Cost to the student includes round trip transportation from San Francisco to the host university, room and board for the academic year, and medical insurance. Incidental expenses, individual travel, etc., must be borne by the participant. In 1967-68 these costs are: Taiwan, \$1,770; France, Germany, Spain, \$1,970; Italy, Japan, \$2,070; Sweden, \$2,270. Payments may be scheduled throughout the year.

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

Application for the 1968-69 academic year should be made early in the fall semester 1967. Detailed information may be obtained at the office of the Dean of Students, or by writing to the Office of International Programs, The California State Colleges, 1600 Holloway Avenue, San Francisco, California 94132.

COURSES

Fresno State College students under the California State Colleges International Study 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 at Fresno State College may use Independent Study (190), and International Study 92 or 192. Graduate students may use Independent Study (290) and International Study 292.

IS 92. Projects in Study Abroad: (Subject) (1-3; max total 6)

Open only to students in California State Colleges International Programs. Study undertaken in a university abroad under the auspices of the California State Colleges.

IS 192. Projects in Study Abroads: (Subject) (1-3; max total 6)

Open only to students in California State Colleges International Programs. Study undertaken in a university abroad under the auspices of the California State Colleges.

IS 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 Fresno State College instructor, department chairman, Dean of the School of Graduate Studies. May require one or more papers and oral or written examination on student's return, pending which In Progress (IP) grade will be recorded.

MOSS LANDING MARINE LABORATORIES

The California State 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 colleges (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 College 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.

COURSES

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

- ML 101. General Oceanography (4)
- ML 111. Zoology of Marine Vertebrates (4)
- ML 121. Marine Invertebrate Zoology (4)
- ML 131. Marine Algology (3)
- ML 161. Marine Ecology (3)
- ML 170. Special Problems in the Marine Sciences (1-3)
- ML 181. Literature of the Marine Sciences (1)
- ML 185T. Topics in Marine Science (1-6)
- ML 298. Research in the Marine Sciences (1-3)

SCHOOL OF AGRICULTURE

Agriculture	80
Agricultural Engineering	
General Agriculture	
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Agribusiness	
Agricultural Mechanics	
Animal Science	88
Agribusiness	
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Agribusiness	
Agricultural Inspection and Services	
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Agronomy	
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Ornamental Horticulture	
Viticulture and Enology	

SCHOOL OF AGRICULTURE

Lloyd Dowler, Dean

Assistant to the Dean George F. Ilg

Department

Chairman

Agricultural Mechanics Clarence D. Jensen

Animal Science Jesse T. Bell

Plant Science Wayne E. Biehler

The School of Agriculture provides degree and nondegree curricula preparatory to professions and occupations in agriculture and related fields. For information concerning preveterinary medicine, see *Preprofessional Preparation*: 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 agriculture with twelve specialized majors and in agricultural engineering; three-year technical curricula for students not desiring degree or transfer credit; 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 Agriculture or credential advisers. For revised 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, too late for inclusion elsewhere in this catalog. See the *Graduate Bulletin*.

BACHELOR OF SCIENCE DEGREE IN AGRICULTURE

The bachelor of science degree in agriculture is granted upon completion of a four-year curriculum consisting of 128 semester units selected from one of the major programs. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*). The required agricultural courses for majors along with other requirements, are listed in departments as follows: *Agricultural Mechanics Department*—agribusiness, agricultural mechanics; *Animal Science Department*—agribusiness, agricultural science, animal husbandry, dairy science, poultry husbandry; *Plant Science Department*—agribusiness, agricultural inspection and services, agricultural science, agronomy, horticulture, ornamental horticulture, viticulture and enology. Requirements for the general agriculture major are listed below.

BACHELOR OF SCIENCE DEGREE IN AGRICULTURAL ENGINEERING

The bachelor of science degree in agricultural engineering requires 136 units (see *School of Engineering*) and the completion of the general requirements for the bachelor of science degree (see *Degrees and Credentials*). The required agriculture courses follow a selected pattern approved by the Dean of the School of Agriculture.

BACHELOR OF SCIENCE DEGREE IN AGRIBUSINESS

The bachelor of science degree with a major in agribusiness is granted upon completion of a four-year curriculum consisting of 128 semester units selected from one of the agribusiness major options in the *Agricultural Mechanics*, *Animal Science*, or *Plant Science Departments*, or the *School of Business*. The general education and general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*).

The agribusiness curriculum prepares students in agriculture and business for positions in operations involved in the manufacture of supplies needed on the farm, production operations on the farm, and the storage, distribution, and merchandizing of agricultural commodities.

TECHNICAL AGRICULTURE

Any student who has graduated from high school may make application for admission to the technical agriculture program. Admission to this program is dependent upon a reasonable score on the entrance examination (as determined by appropriate college officials) and approval of the Dean of the School of Agriculture. Technical agriculture programs stress technical and practical training appropriate to the San Joaquin Valley and include maximum laboratory use of the college farm. Students may take production programs in fattening of livestock, growing of crops, and management of breeding herds, flocks, vineyards, and orchards and are employed so far as possible to assist with the operation of the college farm.

Students qualify for the three-year technical agriculture certificate upon completion of the required general education and related courses and one of the technical majors in the *Agricultural Mechanics*, *Animal Science*, or *Plant Science Departments*, with additional selected production courses to make a total of 84 units. Approved nonagricultural courses open to restricted technical students: Math 27, 28; Off Ad 1; Engl 1, 6; Spch 21; Hist. 1, 11 or 12; Pol Sc 11; Biol 1A, 1B; H Sc 90, 91; PEC, M, W (activities); Mus 1 (activities); Psych 7; other specified courses required in the program.

Technical agriculture students enroll in regular agriculture courses with special arrangements to meet their needs. Students admitted to the technical agriculture program who wish to transfer to the degree program may petition the Admissions Committee for such transfer after completing 60 units at Fresno State College with a C average or better.

MINOR

A minor in agriculture is available to degree students in other departments and may be selected from one of the specialized agriculture fields. The minor consists of 20 units of which 12 are upper division.

GENERAL AGRICULTURE MAJOR

The general agriculture major prepares students for diversified farming where a knowledge of farm crops, livestock, and farm machinery is necessary. The curriculum is not intended to replace majors in the School of Agriculture in which students specialize in a single field.

The requirements are flexible and especially well adapted to meet the needs of students interested in teaching vocational agriculture. Many graduates have found positions with county, state, and federal agencies, or in business and services related to agriculture.

Major Requirements

General agriculture majors must complete a minimum of 50 units (18 units upper division) including 15 units in animal science (AH, DS and/or PH), 15 units in plant science (CP, H, OH and/or V), 6 units in agricultural mechanics; and Ag 1, 31, 112, 130, 136. The selection of courses in each of the respective departments is worked out with the student's major adviser.

Additional Requirements

In addition, general agriculture majors must complete the following courses: Biol 1A or B, 120, Bot 1 or Zool 1; Chem 2A-B, 8; Econ 1A; Math 29 or equivalent. A total of 128 semester units including general education is required for the bachelor of science degree.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE

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 is required for the bachelor of science degree. (See *Degrees and Credentials*.)

General Agriculture

1st Year: Ag 1, Chem 2A-B, Biol 1B, AgM electives, plant and animal science electives

2nd Year: Ag 31, Bot 1, Econ 1A, Chem 8, AgM elective, animal and plant science electives

3rd Year: Ag 130, 136, Biol 120, Math 29, animal and plant science electives (u.d.)

4th Year: Ag 112, animal and plant science electives (u.d.)

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*.

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**Ag 1. Agricultural Orientation (1)**

Survey of agriculture and its related agencies; job opportunities.

Ag 13. Pest Control (3)

Survey of the pest control field; insects, plant diseases, rodents, and weeds of importance in agriculture and around the home; methods, materials, and equipment used for their control. (2 lecture, 3 lab hours)

Ag 27. Agribusiness Mathematics (3)

Not open to students with credit in Bus Ad 21 or 27, Math 29 or 30. Basic mathematics for agriculture. 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.

Ag 31. Agricultural Economics (3)

Prerequisite: Econ 1A. Farm credit, taxation, marketing and commodity problems; government agencies and farm price structures.

Ag 40. Project Records (1)

For students planning to sign up for a project; may be taken concurrently. Organization of the Agricultural Foundation; budgets, contracts, and records needed to conduct an agricultural project under college supervision. (See *Supervised Projects* in the Animal and Plant Science Departments.)

Ag 105. Plant Quarantine Laws (3)

For students interested in county, state, or federal inspection work. Federal, California state, and county laws relating to plant quarantine to prevent the introduction and spread of agricultural pests as outlined in the *California Agricultural Code*.

Ag 106. Economic Entomology (3) (Same as Ent 106)

Prerequisite: Biol 1A or B. General and economic entomology; taxonomy of the principal orders of insects; life histories, habits, recognition, and control of some of the principal agricultural insect pests of the San Joaquin Valley. (2 lecture, 3 lab hours, field trips)

Ag 112. Farm Management (3)

Prerequisite: junior standing. Survey of farm management; basic economic principles relating to farm management; organizing the individual farm unit; balancing crop and livestock enterprises; farm business administration. (2 lecture, 3 lab hours)

Ag 113. Apiculture (2)

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)

Ag 114. California Fruit and Vegetable Standards (3)

For students interested in government fruit inspection. California laws and enforcement of regulations for packing or shipping fruits, nuts and vegetables. (2 lecture, 3 lab hours)

Ag 130. Plant Pathology (4)

Prerequisite: Bot 1. Nature, cause, and control of plant disease in economic agriculture plants. (2 lecture, 6 lab hours)

Ag 136. Soils (3)

Physical and chemical properties of soils influenced by climate, parent material, topography, organisms, and time; use, interpretation and evaluation of soil practices and research, including soil maps, field experiments, fertilizers, physical and chemical analysis. (2 lecture, 3 lab hours; one Saturday field trip)

Ag 146. Irrigation (3)

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)

Ag 151. Farm Accounting (3)

Prerequisite: Econ 1A, Ag 27, or permission of instructor. Farm accounting systems, farm records, budgets, income tax returns. (2 lectures, 3 lab hours)

Ag 159. Spray Materials (3)

Prerequisite: Chem 2A-B. Development of agricultural chemical industry; chemical properties of compounds used as insecticides, fungicides, rodenticides and herbicides; formulations, regulations and typical uses of these materials. (2 lecture, 3 lab hours)

Ag 180. Special Problems (1-4; max total 4)

Open to juniors or seniors with permission of instructor. May not be substituted for course requirements in major. Exploratory work on a suitable agricultural problem in animal science, plant science, or agricultural mechanics.

Ag 182. Soil Management (3)

Prerequisite: Ag 136 or equivalent, Chem 2A-B. Factors affecting soil fertility, management of soils, attaining continuous maximum productivity. Physical, chemical and field tests on soil fertility, crop and livestock soil management. (2 lecture, 3 lab hours; one week-end field trip)

Ag 184. Advanced Irrigation (3)

Prerequisite: Ag 146 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; one week-end field trip)

Ag 186. Methods of Teaching General Agriculture (3)

Prerequisite: E Ed 105; S Ed 163 or permission of instructor. Philosophy and teaching techniques in general agriculture; organization of teaching materials; professional standards for teachers.

Ag 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

Ag 280. Seminar in Agriculture (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.

Ag 290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

AGRICULTURAL MECHANICS DEPARTMENT

Principal Vocational Instructor: C. Jensen (Chairman)
 Intermediate Vocational Instructor: DeTar, H. Martin
 Part-time: A. Johnson, Lundeen

The Agricultural Mechanics Department offers majors in agribusiness and agricultural mechanics for students who wish to qualify for positions in such fields as farm equipment sales and service, farm structures, rural electrification, teaching vocational agriculture, and farming. Students are trained in the selection, operation, construction, maintenance, and repair of equipment and structures used in modern agriculture.

The *agribusiness major* with an option in agricultural mechanics prepares students for positions in areas such as farm machinery and equipment sales; appraising for insurance companies and banks; management, credit, accounting and other office work; and general farming.

The Agricultural Mechanics Building and the Farm Machinery Center located adjacent to it provide excellent laboratory facilities. The production of hay, cotton, corn, grain crops, grapes, and fruit provides excellent opportunities for a study of farm machinery equipment under varied conditions. The entire College Farm is used as a working laboratory.

Students majoring in *agricultural engineering* enroll under the *School of Engineering*. A minimum of 23 units in agricultural mechanics and agriculture is included in the program.

MAJOR REQUIREMENTS

Agribusiness (Agricultural Mechanics Option)	<i>Units</i>
<i>BS Degree Major:</i> AgM 15, 17, 18A, 25, 81, 91, 111, 115, 116, 151A-B, 158, 159; Ag 1, 31, 112, 136, 146, 182 or 184; Acct 1A-B; Mkt 100; Bus Ad 102, 110, 118A-B, 133, 151; business elective (3 u.d.).....	74
Agricultural Mechanics	
<i>BS Degree Major:</i> AgM 15, 17, 18A-B, 25, 81, 91, 111, 115, 116, 121, 151A-B, 158, 159; Ag 1, 136, 146, 151.....	42
<i>Technical Certificate:</i> AgM 15, 17, 18A-B, 25, 81, 111, 115, 116, 121; Ag 1, 27, 31, 40, 146, 151; AgM elective (2 un)	36

Additional Requirements—BS Degree

In addition to major requirements, degree students (except agribusiness) must complete the following courses: Chem 2A, Physics 2A; animal science and/or plant science electives (6 un); IA 74; Econ 1A; Biol 1A or B; Math 29, 30. Agribusiness majors take Biol 1A or B, Chem 2A, Physics 2A, Econ 1A-B, Math 29, 30. A total of 128 semester units including general education is required for the bachelor of science degree.

Additional Requirements—Technical Certificate

Technical students must complete in addition to the major requirements, the following courses: animal science and/or plant science electives (10 un); Hist 11 or 12, Pol Sc 11; Biol 1A or B; PE (4 semesters); H Sc 90 or 91; Engl 1; Spch 21. A total of 84 semester units is required for the technical certificate.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE

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*.)

Agribusiness (Agricultural Mechanics Option)

1st Year: Ag 1, AgM 15, 17, 18A, Math 29, 30, Biol 1A or B

2nd Year: AgM 25, 81, 91, Acct 1A-B, Chem 2A, Econ 1A-B, Physics 2A

3rd Year: Ag 31, 136, AgM 111, 115, 116, 159, Bus Ad 102, 110, 118A-B, 133

4th Year: Ag 112, 146, 182 or 184, AgM 151A-B, 158, Bus Ad 151, Mkt 100, business elective (3 u.d.)

Agricultural Mechanics

1st Year: Ag 1, AgM 15, 17, 18A, Biol 1A or B, Math 29, 30

2nd Year: AgM 25, 18B, 81, 91, Chem 2A, Physics 2A, Econ 1A

3rd Year: Ag 136, 146, AgM 111, 115, 116, 1A 74, animal or plant science electives

4th Year: Ag 151, AgM 121, 151A-B, 158, 159

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 MECHANICS**AgM 15. Agricultural Mechanics (2)**

Mechanical skills in field of agriculture; selection, care and use of common farm tools; projects of wood and metal in farm appliances. (1 lecture, 3 lab hours)

AgM 17. Farm Tractors (2)

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. (1 lecture, 3 lab hours; and total of 5 hours of field operation.)

AgM 18A-B. Agricultural Welding (2-2)

Prerequisite or concurrently: AgM 15. (A) Arc and oxyacetylene welding as a tool of construction and repair in the farm shop; brazing; building up worn parts; burning with hand torch. (B) Hard facing by arc and gas welding; AC and DC welding and application to farm construction and repair; welding projects and farm appliances. (1 lecture, 3 lab hours)

AgM 25. Agricultural Drafting (2)

May be taken concurrently with AgM 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. (1 lecture, 3 lab hours)

AgM 81. Farm Structures and Equipment (2)

Prerequisite: AgM 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. (1 lecture, 3 lab hours)

AgM 91. Farm Surveying (2)

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. (1 lecture, 3 lab hours)

AgM 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.

AgM 111L. Rural Electrification Laboratory (1)

Laboratory experiments to accompany AgM 111. (3 lab hours)

AgM 115. Farm Machinery (2)

Prerequisite: AgM 15. Study and operation of tillage tools, interaction of the soil and tool; cotton, grain, and specialized harvesting machinery and equipment. (1 lecture, 3 lab hours)

AgM 116. Farm Machinery (2)

Prerequisite: AgM 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. (1 lecture, 3 lab hours)

AgM 121. Advanced Agricultural Welding (2)

Prerequisite: AgM 18A-B. 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. (1 lecture, 3 lab hours)

AgM 151A-B. Farm Power (2-2)

Prerequisite: AgM 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. (1 lecture, 3 lab hours)

AgM 158. Unit Operations I (3) (See V 158A)**AgM 159. Pumps and Motors (3)**

Prerequisite: AgM 15, Ag 146. 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)

AgM 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

ANIMAL SCIENCE DEPARTMENT

Principal Vocational Instructor: Bell (Chairman), Glim, Hixson, Ilg, Rousek, Selkirk, W. E. Smith

Associate Professor: Ball

Senior Vocational Instructor: Pflueger

Intermediate Vocational Instructor: D. Nelson, Sasser

Part-time: Briggs, Kleist, Larsen, Reininghaus

The Animal Science Department offers majors in agribusiness, agricultural science, animal husbandry, dairy husbandry, dairy industry, poultry husbandry, and preprofessional training for veterinary medicine.

The *agribusiness* major with an option in animal science prepares students for positions in areas such as agricultural sales, including veterinary supplies, feeds; appraising for insurance companies and banks; management, credit, accounting and other office work; and general farming.

The *agricultural science* major with an option in animal science prepares students for highly science-oriented job objectives and provides the necessary undergraduate courses for students seeking advanced degrees.

The *animal husbandry* major prepares students for occupations in farming where beef cattle, sheep, swine and horse enterprises are an important part of the industry. Many graduates in this department are engaged in the livestock and farming business or in other agribusiness occupations. The department maintains purebred herds of Hereford, Shorthorn and Angus beef cattle; a purebred flock of Rambouillet, Columbia, and Hampshire sheep; four breeds of swine—Berkshire, Hampshire, Yorkshire, and Duroc; and a complement of registered quarter horses.

The *dairy science* major with *dairy husbandry* option trains students for commercial dairy farming enterprises, dairy herd management, milk testing, fieldwork for breeding associations, dairy sanitation, and for other agribusiness occupations. 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 training in dairy husbandry.

The *dairy science* major with *dairy industry* option prepares students for jobs in dairy plants in processing milk, ice cream, cheese, butter, and other dairy products. The college maintains its own processing plant for bottling milk and teaching the required courses in butter making, ice cream, cheese, and dairy plant management. Dairy products are processed for the college cafeteria and retail sales store by students as a part of the practical training program.

The *poultry husbandry* major prepares students for occupations in commercial egg production, fryer operations, breeder flock management, hatchery, processing, and sales positions with feed companies. Many graduates operate their own turkey and poultry farms. The poultry plant 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 along with sunshine brooders; intermediate growing batteries and wire floor cage houses. Over 3,000 birds are maintained in the college flock.

The *preveterinary* program provides the first two years of training required in veterinary medicine (see *Preprofessional Programs*).

SUPERVISED PROJECTS

The agriculture 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 de-

velop 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 with the Fresno State College Agricultural Foundation 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. Completion of a one-unit course, Ag 40, Project Records, is required either prior to or concurrently with a project.

In the Animal Science Department, some students feed out steers, lambs, and pigs. Others have fryer, turkey, or commercial egg production projects. Students may bring lambs or steers from their home farms and feed them out at the college, provided feed is purchased from the college feed mill and a pen rental fee is paid monthly.

MAJOR REQUIREMENTS

	<i>Units</i>
Agribusiness (Animal Science Option)	
<i>BS Degree Major:</i> Ag 1, 31, 112, 136, AH 1, 71, 116, 172, 175; DS 11A, PH 1; elect 15 units from the following majors (animal husbandry, dairy husbandry option, dairy industry option, and/or poultry husbandry), 9 of which must be completed in one major; Acct 1A-B, Mkt 100, Bus Ad 102, 110, 118A-B, 133, 151; elect Mkt 102, Bus Ad 171, 177, or 179.....	76
Agricultural Science (Animal Science Option)	
<i>BS Degree Major:</i> Ag 1, 112, AH 1, 22, 30, 40, 71, 172, 175; <i>animal science</i> electives from one of the following fields—animal husbandry, poultry husbandry, dairy science (9 un).....	34
Animal Husbandry	
<i>BS Degree Major:</i> AH 1, 2, 22, 30, 40, 71, 106, 115, 116, 172; Ag 1, 27, 112, 136, 151; AH electives (4 un).....	46
<i>Technical Certificate:</i> AH 1, 2, 22, 25, 30, 40, 71, 172; Ag 1, 27, 31, 40, 151; AH electives (5 un).....	39
Dairy Science (Dairy Husbandry Option)	
<i>BS Degree Major:</i> DS 11A-B, 53, 55, 56, 102, 106, 165; Ag 1, 27, 136, 151; AH 71, 115, 116, 172; DS elective (2 un).....	46
<i>Technical Certificate:</i> DS 11A-B, 53, 55, 56, 102, 106, 108; Ag 1, 27, 31, 40, 151; AH 71, 172.....	38
Dairy Science (Dairy Industry Option)	
<i>BS Degree Major:</i> DS 11A-B, 53, 58, 103, 104, 107, 151, 154, 156, 165, 185, 189; Ag 1, 27.....	40
<i>Technical Certificate:</i> DS 11A-B, 53, 55, 58, 103, 104, 107, 189; Ag 1, 27, 31, 40, 151.....	35
Poultry Husbandry	
<i>BS Degree Major:</i> PH 1, 32, 34, 161, 162, 163, 164, 181, 182; Ag 1, 27, 136, 151; AH 115, AH or DS electives (8 un).....	47
<i>Technical Certificate:</i> PH 1, 32, 34, 161, 162, 163, 164, 182; Ag 1, 27, 31, 40, 151; AH or DS electives (3 un).....	37

Additional Requirements—BS Degree

In addition to major requirements, degree students must complete the courses indicated below for each program. A total of 128 semester units including general education is required for the bachelor of science degree. Ag 27 not required for students with credit in second year high school algebra or equivalent.

Agribusiness (Animal Science Option): Biol 1B; Chem 2A-B, 8; Econ 1A-B, Math 40 or 51.

Agricultural Science (Animal Science Option): Bact 20, Biol 1A, 120, Chem 1A-B, 8, 105, 109, Math 40, Physics 2A, Zool 1, Biol 116 or Zool 103.

Animal Husbandry: Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A, 120; Econ 1A.

Dairy Science (Dairy Husbandry Option): Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A, 120; Econ 1A.

Dairy Science (Dairy Industry Option): Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A; Econ 1A; Bus Ad 110; Acct 1A.

Poultry Husbandry: Bact 20; AgM electives (6 un); Zool 1; Chem 2A-B, 8; Biol 1A, 120; Econ 1A.

Additional Requirements—Technical Certificate

Technical students must complete, in addition to the major requirements, the following courses. A total of 84 semester units is required for the technical certificate.

AgM electives (6 un), animal science and/or plant science electives (10 un), Hist 11 or 12, Pol Sci 11, Biol 1A or B, Engl 1, Spch 21, PE (4 semesters), H Sc 90 or 91.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE

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 is required for the bachelor of science degree. (See *Degrees and Credentials*.)

Agribusiness (Animal Science Option)

1st Year: Ag 1, Biol 1B, Chem 2A-B, AH 1, PH 1, animal science electives

2nd Year: AH 71, 172, DS 11A, Acct 1A-B, Chem 8, Econ 1A-B, Math 40 or 51

3rd Year: Ag 31, 136, AH 116, Bus Ad 102, 110, 118A-B, 133

4th Year: Ag 112, AH 175, Bus Ad 151, Mkt 100, Mkt 102 or Bus Ad 171, 177 or 179, animal science electives

Agricultural Science (Animal Science Option)

1st Year: Ag 1, AH 1, 22, Biol 1A, Math 40, Zool 1

2nd Year: AH 30, 40, Chem 1A-B

3rd Year: AH 71, 172, Bact 20, Biol 120, Chem 8, 105, 109, Physics 2A

4th Year: AH 175, Ag 112, animal science electives, Biol 116 or Zool 103

Animal Husbandry

1st Year: Ag 1, 27, AH 1, 2, Biol 1A, Chem 2A-B, AgM electives

2nd Year: AH 22, 71, 172, Chem 8, Econ 1A, Zool 1, AH and AgM electives

3rd Year: Ag 136, AH 30, 115, 116, Bact 20, Biol 120

4th Year: Ag 112, 151, AH 40, 106, AH electives

Dairy Science (Dairy Husbandry Option)

1st Year: Ag 1, 27, DS 11A-B, Biol 1A, Chem 2A-B, AgM electives

2nd Year: AH 71, 172, DS 53, 55, 56, Chem 8, Econ 1A, Zool 1, AgM elective

3rd Year: Ag 136, AH 115, 116, Bact 20, Biol 120

4th Year: Ag 151, DS 102, 106, 165, DS elective

Dairy Science (Dairy Industry Option)

1st Year: Ag 1, DS 11A-B, Biol 1A, Chem 2A-B, AgM electives

2nd Year: Ag 27, DS 53, 107, Chem 8, Econ 1A, Zool 1, AgM elective

3rd Year: DS 58, 103, 104, Acct 1A, Bact 20, Bus Ad 110

4th Year: DS 151, 154, 156, 165, 185, 189

Poultry Husbandry

1st Year: Ag 1, PH 1, 34, Biol 1A, Chem 2A-B, AgM electives

2nd Year: Ag 27, PH 32, Chem 8, Econ 1A, Zool 1, AgM elective

3rd Year: Ag 136, AH 115, PH 161, 163, 164, Bact 20, Biol 120

4th Year: Ag 151, PH 162, 181, 182, AH or DS electives

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 HUSBANDRY**AH 1. Introduction to Animal Husbandry (3)**

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)

AH 2. Livestock Selection (2)

Prerequisite: AH 1. A beginning course in judging market and breeding classes of beef cattle, swine, sheep, and horses. (1 lecture, 3 lab hours)

AH 3. Livestock Judging (2)

Prerequisite: AH 1, 2. Follows AH 1 and 2 in judging market and breeding classes of beef cattle, swine, sheep, and horses. (1 lecture, 3 lab hours)

AH 10. Slaughtering and Meat Cutting (3)

Prerequisite: AH 1. Slaughtering of farm meat animals; cutting of carcasses into wholesale and retail cuts; related meats material. (2 lecture, 3 lab hours)

AH 22. Beef Husbandry (3)

Prerequisite: AH 1. Management of purebred and commercial beef herds; selection of breeding stock; management practices in fattening cattle; marketing of slaughter and purebred cattle. (2 lecture, 3 lab hours)

AH 25. Fitting and Showing Livestock (3)

Prerequisite: AH 1. Techniques in selecting, fitting, and showing livestock; classification and entrance requirements for shows; rules, regulations, fair management, sales organization. (2 lecture, 3 lab hours)

AH 30. Swine Husbandry (3)

Prerequisite: AH 1. Principles and practices of purebred and commercial swine husbandry; breeding, feeding, and management program. (2 lecture, 3 lab hours)

AH 40. Sheep Husbandry (3)

Prerequisite: AH 1. 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, and storing the wool. (2 lecture, 3 lab hours)

AH 50. Horse Husbandry (3)

Prerequisite: AH 1, 2. Breeds, selection, care, and feeding of light horses; their use and place in the agriculture of California. (2 lecture, 3 lab hours)

AH 71. Feeds and Feeding (3)

Prerequisite: AH 1, Chem 2A-B, Biol 1A or B. Composition and nutritive value of livestock feeds and their utilization by the farm animal body; processes of digestion and assimilation; feeding standards and basic principles of feeding farm animals.

AH 73. Feed Mill Management (2)

Prerequisite: AH 71 or PH 32. Operation and maintenance of feed mills; compiling rations; mixing, buying and selling feeds; participation in management and operation of college feed mill. (1 lecture, 3 lab hours)

AH 103. Advanced Livestock Judging (2)

Prerequisite: AH 2, 3, or permission of instructor. Livestock judging preparing individuals to better select animals according to breed types and characteristics. Trips to intercollegiate judging contests. (1 lecture, 3 lab hours)

AH 106. Animal Breeding (3) (Same as DS 106)

Prerequisite: Biol 120, AH 1 or DS 11A. Principles of physiology and heredity as applied to the breeding of farm animals; application of genetics to a livestock breeding program.

AH 115. Anatomy and Physiology of Farm Animals (3)

Prerequisite: Zool 1, Chem 8. General structures of farm animals and physiological functions of organs of the animal body. (2 lecture, 3 lab hours)

AH 116. Livestock Sanitation and Diseases (3)

Prerequisite: AH 115 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)

AH 122. Advanced Beef Production (3)

Prerequisite: AH 22. Study of research material in breeding, nutrition, diseases and management; records of performance, pedigrees, purebred sales and show herd management. (2 lecture, 3 lab hours; 1 week-end field trip)

AH 133. Market Swine Production (3)

Prerequisite: AH 1, 30. Types, market classes, and grades of swine; food demands, building and equipment requirements, marketing methods, and management problems in market swine production. (2 lecture, 3 lab hours)

AH 143. Advanced Sheep and Wool Technology (3)

Prerequisite: AH 40, Chem 2A-B, 8. Research material in breeding, nutrition, diseases, progeny and performance testing; carcass quality improvement and economics of sheep industry; testing techniques in wool technology, grade and other physical measurements, properties and characteristics determining value; role of wool in world trade. (2 lecture, 3 lab hours; 2 field trips)

AH 150. Advanced Horse Husbandry (3)

Prerequisite: AH 1, 50. Advanced principles of horse husbandry including management of horse breeding farms, breeding systems, training and selling horses, and western equitation. (1 lecture, 6 lab hours; 1 week-end field trip)

AH 170. Animal Husbandry Seminar (1; max total 2)

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.

AH 172. Animal Nutrition (3)

Prerequisite: AH 71, Chem 8, or permission of instructor. Principles of animal nutrition; nutritive requirements for growth, fattening, reproduction, lactation and other body functions of farm animals; relationship of malnutrition and deficiency diseases to livestock production.

AH 175. Grading and Marketing Livestock (3)

Prerequisite: AH 1, 2. Grading live and dressed carcasses; determining cut-out values for beef, sheep, and swine. (2 lecture, 3 lab hours; field trips to central markets)

AH 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

ANIMAL SCIENCE**An Sc 160T. Topics in Animal Science (1-4; max total 4)**

Prerequisite: junior standing; permission of instructor. Topics in animal science: anatomy, physiology, pathology, nutrition, genetics, economics.

DAIRY SCIENCE**DS 11A-B. Introduction to Dairying (3-3)**

A general survey of the growth and development of dairying. (A) Principles and practices in the production of milk; basic feeding, management, and disease control practices. (B) Basic principles of dairy industry practices; common dairy tests; general survey of all important branches of the industry. (2 lecture, 3 lab hours)

DS 53. Market Milk (3)

Prerequisite: DS 11A-B or permission of instructor. Principles of market milk production, processing and distribution; modern processing methods and equipment. (2 lecture, 3 lab hours)

DS 55. Dairy Cattle Judging (2)

Prerequisite: DS 11A. Judging dairy cattle on type and conformation; comparative judging of cattle in college herd and outstanding dairy herds in the San Joaquin Valley. (1 lecture, 3 lab hours)

DS 56. Dairy Cattle Selection (2)

Correlation of production and pedigree records together with type classifications in selection of dairy cattle. (1 lecture, 3 lab hours)

DS 58. Judging Dairy Products (2)

Prerequisite: DS 11A-B. Practice in scoring and grading dairy products; methods of control of defects. (1 lecture, 3 lab hours)

DS 73. Dairy Plant Practice (3)

Open only to dairy industry majors. Prerequisite: DS 11A-B or permission of instructor. Six weeks of practical experience or its equivalent in an approved dairy processing plant. Written reports required.

DS 102. Dairy Farm Management (3)

Prerequisite: DS 11A-B 55, 56, Econ 1A. Problems in management of a dairy farm; marketing problems and factors in controlling milk secretion. (2 lecture, 3 lab hours)

DS 103. Butter Making (3)

Prerequisite: DS 53 or permission of instructor. Production, grading, and marketing of cream for butter; manufacture and marketing of butter; modern equipment used in manufacturing and packaging. (2 lecture, 3 lab hours)

DS 104. Cheese Making (3)

Prerequisite: DS 53 or permission of instructor. Methods of manufacturing common varieties of cheese; types of cheese common to the San Joaquin Valley. (2 lecture, 3 lab hours)

DS 105. Advanced Dairy Cattle Judging (2)

Prerequisite: DS 55, 56. Advanced practice in comparative judging and selection of dairy cattle; detailed scoring of cattle and practice in justifying comparative placing. Trips to intercollegiate judging contests. (1 lecture, 3 lab hours)

DS 106. Animal Breeding (3) (See AH 106)**DS 107. Ice Cream Making (3)**

Open only to juniors and seniors. Prerequisite: DS 53 or permission of instructor. Basic principles of formulating ice cream mixes; freezing and storage of ice cream, sherbets, and ices; modern freezing, packaging, and storage facilities in the San Joaquin Valley. (2 lecture, 3 lab hours)

DS 108. Selecting, Fitting and Showing Dairy Cattle (2)

Prerequisite: DS 11A-B, 55. Techniques in selecting and fitting dairy cattle for shows and sales; entrance requirements for dairy cattle in California fairs and shows. (1 lecture, 3 lab hours)

DS 110. Artificial Insemination (2)

Prerequisite: DS 11A, Biol 120, AH 115. Basic principles of artificial insemination of dairy cattle; semen collection, processing, evaluation and use. (1 lecture, 3 lab hours)

DS 151. Dairy Bacteriology (3)

Prerequisite: Bact 20. Bacteria, yeasts, and molds in manufacture of dairy products. (2 lecture, 3 lab hours)

DS 154. Dairy Plant Management (3)

Prerequisite: DS 103, 104, 107, Acct 1A. Application of principles of management to dairy manufacturing plants; cost accounting, selling, advertising, and labor problems; current local problems.

DS 156. Marketing Dairy Products (3)

Prerequisite: DS 103, 104, 107, Acct 1A. Principles of purchasing and marketing dairy products; products of the San Joaquin Valley.

DS 165. Dairy Inspection (3)

Prerequisite: DS 11A-B. Methods of scoring and grading dairy farms, milk plants, and creameries; California Agricultural Code as it applies to dairies and dairy plants; tests and their application to control work. (3 lecture hours; 3 3-hour field trips)

DS 185. Advanced Testing (2)

Prerequisite: Chem 2A-B, 8. Full operation of the Mojonnier Dairy Products Tester for analyzing all dairy products for fat and total solids. (1 lecture, 3 lab hours)

DS 189. Advanced Dairy Products Judging (2)

Prerequisite: DS 58. Product judging; training for participation in judging contest work. Trips to intercollegiate judging contests. (1 lecture, 3 lab hours)

DS 190. Independent Study (1-3; max see reference)

See Regulations and Procedures—Independent Study.

POULTRY HUSBANDRY**PH 1. Poultry Production (3)**

Poultry production; brooding, rearing, laying flocks, feeding, and housing. (2 lecture, 3 lab hours)

PH 32. Poultry Feeding (3)

Prerequisite: PH 1. Poultry feeds and application of principles of nutrition to poultry and turkey feeding. (2 lecture, 3 lab hours)

PH 34. Egg Processing and Marketing (3)

Principles, practices, and problems in processing and marketing shell eggs and egg products. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 161. Turkey Management (3)

Prerequisite: PH 32. Principles and practices in commercial production of turkeys for meat and in turkey breeding. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 162. Poultry Management (3)

Prerequisite: PH 32. Principles and practices in commercial egg production for wire-floored and conventional litter-type housing. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 163. Poultry Products and Processing (3)

Prerequisite: PH 1. Grading, processing, preservation, and marketing of poultry. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 164. Hatchery Management (3)

Prerequisite: PH 1 Hatchery operations, including practical work. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 181. Poultry Breeding (3)

Prerequisite: Biol 120, PH 1. Selection of poultry breeding flocks and application of principles of genetics to poultry breeding. (2 lecture, 3 lab hours; 1 Saturday field trip)

PH 182. Poultry Diseases and Sanitation (2)

Prerequisite: PH 1, AH 115. Anatomy and physiology of fowl; poultry diseases. (1 lecture, 3 lab hours)

PH 190. Independent Study (1-3; max see reference)

See Regulations and Procedures—Independent Study.

PLANT SCIENCE DEPARTMENT

Principal Vocational Instructors: Biehler (Chairman), Braun, Petrucci, Strong

Senior Vocational Instructor: Karle, R. D. Harrison, LeValley

Intermediate Vocational Instructors: J. Jones, Norton, Van Elswyk

Part-time: Aten, Ishimoto

The Plant Science Department offers majors in agribusiness, agricultural inspection and services, agricultural science, agronomy, horticulture, ornamental horticulture, and viticulture and enology.

The department has excellent facilities for classroom and laboratory work. The agriculture classroom building is well equipped and provides laboratory facilities for soils and irrigation, cotton classing, grains and grasses, horticulture, viticulture, plant disease, and ornamental horticulture. The College Farm includes a 160-acre vineyard, 105 acres of orchard, 15 acres for the nursery, and adequate acreage for cotton, corn, grain, and vegetable crop projects. A part of the College Farm is planted to permanent pasture and hay crops for livestock. The entire 1,190 acres is used as a working laboratory. A horticulture and viticulture packing shed and a raisin processing plant make it possible for students to pack out and process their own fruit, grapes, and raisins grown in the project program.

The *agribusiness major with an option in plant science* prepares students for positions in areas such as agricultural sales, including seeds, fertilizers, insecticides, weedicides, herbicides and fungicides; appraising for insurance companies and banks; fruit, grain, and vegetable buying; management, credit, accounting and other office work in related agricultural industry; and general farming.

The *agricultural inspection and services major* prepares students for job opportunities in civil service positions with county, state, and federal agencies. These agencies employ inspectors to enforce the agricultural laws and regulations which have been established for the protection of various agriculture enterprises. This major will also qualify students for sales positions with chemical and insecticide companies.

The *agricultural science major with an option in plant science* prepares students for a highly science-oriented job objective and provides the necessary undergraduate courses for students seeking advanced degrees.

The *agronomy major* prepares students for field crop production and for general farming involving combinations of both crops and livestock; for placement in such fields as service and sales in seeds, weed and pest control, and fertilizers; as research assistants; as fieldmen with chemical companies; positions in the Soil Conservation Service; gin managers; for county, state and federal government employment as agronomists; and as farm foremen.

The *horticulture major* prepares students for general fruit farming, managers of orchards, inspectors in fruit processing plants, supervisory positions in fruit packing plants, and for careers with county, state, and federal agencies.

The *ornamental horticulture major* prepares students for the nursery industry, landscaping and grounds work, sales positions, and teacher education in general agriculture.

The *viticulture and enology major with enology option* prepares students for positions in the California wine industry. Typical positions include laboratory technicians, cellar foremen, plant sanitarians, wine chemists, processing department supervisors, production managers, and winery and vineyard fieldmen.

The *viticulture and enology major with viticulture option* prepares students for a wide variety of jobs, such as vineyard foremen, extension assistants, inspectors for raisin plants, grape buyers, field and plant representatives, shipping clerks, salesmen of chemical supplies and insecticides. Many graduates return to farms where they operate their own vineyards.

SUPERVISED PROJECTS

The agriculture 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 with the Fresno State College Agricultural Foundation 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. Completion of a one-unit course, Ag 40, Project Records, is required either prior to or concurrently with a project.

In the Plant Science Department, each of the major programs provides 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.

MAJOR REQUIREMENTS

	<i>Units</i>
Agribusiness (Plant Science Option)	
<i>BS Degree Major:</i> Ag 1, 31, 106, 112, 130, 136, 146, 159, CP 60; elect 12 units from one of the following majors (ag inspection and services, agronomy, horticulture, ornamental horticulture, or viticulture and enology); Acct 1A-B, Mkt 100, Bus Ad 102, 110, 118A-B, 133, 151, business electives (3 u.d.)	68
Agricultural Inspection and Services	
<i>BS Degree Major:</i> Ag 1, 13, 105, 106, 113, 114, 130, 136, 151, 159, CP 12, 60, H 12, 57, 181, OH 33, V 11, 50; V 101, Ag 112, or H 112	55
<i>Technical Certificate:</i> Ag 1, 13, 27, 31, 40, 105, 106, 113, 114, 151, 159, CP 12, 60, H 12, 57, OH 33, V 11, 50	49
Agricultural Science (Plant Science Option)	
<i>BS Degree Major:</i> Ag 1, 106, 112, 130, 136, 159; plant science electives from one of the following fields—agronomy, horticulture, ornamental horticulture, or viticulture and enology (17 un)	34
Agronomy	
<i>BS Degree Major:</i> CP 11, 12, 60, 150, Ag 1, 106, 112, 130, 136, 146, 151, Bot 104, CP electives (12 un)	48
<i>Technical Certificate:</i> CP 11, 12, 60, Ag 1, 27, 31, 40, 106, 146, 151, CP electives (9 un)	35
Horticulture	
<i>BS Degree Major:</i> H 11, 12, 57, 112, 181, 186, Ag 1, 106, 114, 130, 136, 146, 151, Bot 104, V 11 or 16, H elective (3 un)	48
<i>Technical Certificate:</i> H 11, 12, 57, 112, 186, Ag 1, 27, 31, 40, 105, 114, 151, 159, H elective (3 un)	38
Ornamental Horticulture	
<i>BS Degree Major:</i> OH 3, 22, 33, 53, 123, 125, 132, 162, 163, Ag 1, 31, 106, 130, 136, 146, 159, Bot 104	51
<i>Technical Certificate:</i> OH 3, 22, 33, 53, 123, 125, Ag 1, 13, 27, 31, 40, 151, 159, H 11 or V 11	38

Viticulture and Enology (Enology Option)

Units

BS Degree Major: V 15, 50, 115, 116, 158A-B, 160, 171, Ag 1, Bact 20 or 54, V electives (6 un)..... 38-39

Viticulture and Enology (Viticulture Option)

BS Degree Major: V 11, 13, 15, 16, 50, 101, 110, 166, 170, Ag 1, 106, 130, 136, 146, 151, Bot 104, H 11 or 12..... 48

Technical Certificate: V 11, 13, 15, 16, 50, 101, 110, 166, Ag 1, 27, 31, 40, 106, 151 37

Additional Requirements—BS Degree

In addition to major requirements, degree students must complete the courses indicated below for each program. A total of 128 semester units including general education is required for the bachelor of science degree.

Agribusiness (Plant Science Option): Biol 1A, Bot 104, Chem 2A-B, 8, Econ 1A-B.

Agricultural Inspection and Services: Bact 20, AgM electives (4 un), Bot 1, Chem 2A-B, 8, Biol 1B, Econ 1A.

Agricultural Science (Plant Science Option): Bact 20, Biol 1B, 120, Bot 1, Chem 1A-B, 8, 105, 109, Math 40, Physics 2A, Biol 116 or Zool 103.

Agronomy: AgM electives (8 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Horticulture: Bact 20, AgM electives (6 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Ornamental Horticulture: Bact 20, AgM electives (4 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Viticulture and Enology (Enology Option): Acct 1A-B, Bus Ad 110, Chem 2A-B, 8, 105, 109, Econ 1A-B, Biol 1A, Math 29, Physics 2A-B.

Viticulture and Enology (Viticulture Option): Bact 20, AgM electives (6 un), Bot 1, Chem 2A-B, 8, Biol 1B, 120, Econ 1A.

Additional Requirements—Technical Certificate

Technical students must complete, in addition to the major requirements, the following courses. A total of 84 semester units is required for the technical certificate.

AgM electives (6 un), animal science and/or plant science electives (10 un), Hist 11 or 12, Pol Sc 11, Biol 1A or B, H Sc 90 or 91, PE (4 semesters), Engl 1, Spch 21.

Agricultural Inspection and Services majors are not required to complete the animal science and/or plant science electives (10 un) and must complete only 4 units of AgM electives. *Agronomy* majors are required to complete 8 units of AgM electives.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE

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 is required for the bachelor of science degree. (See *Degrees and Credentials*.)

Agribusiness (Plant Science Option)

1st Year: Ag 1 Biol 1A, Chem 2A-B, plant science electives

2nd Year: Ag 31, CP 60, Acct 1A-B, Chem 8, Econ 1A-B, plant science electives

3rd Year: Ag 106, 136, 146, Bus Ad 102, 110, 118A-B, Bot 104

4th Year: Ag 112, 130, 159, Bus Ad 133, 151, Mkr 100, business elective

Agricultural Inspection and Services

- 1st Year: Ag 1, 13, CP 12, Biol 1B, Chem 2A-B, AgM electives
 2nd Year: CP 60, H 57, OH 33, Bact 20, Bot 1, Chem 8, Econ 1A
 Summer: V 50
 3rd Year: Ag 105, 106, 136, 159, H 12, V 11
 4th Year: Ag 113, 114, 130, 151, H 181; V 101, H 112, or Ag 112

Agricultural Science (Plant Science Option)

- 1st Year: Ag 1, Biol 1B, Bot 1, Math 40, plant science electives
 2nd Year: Chem 1A-B, plant science electives
 3rd Year: Ag 136, Biol 120, Chem 8, 105, 109, Physics 2A, plant science electives
 4th Year: Ag 106, 112, 130, 159, Bact 20, Biol 116 or Zool 103

Agronomy

- 1st Year: Ag 1, CP 11, 12, Biol 1B, Chem 2A-B, AgM electives
 2nd Year: Bot 1, Chem 8, Econ 1A, AgM and CP electives
 3rd Year: Ag 106, 136, CP 60, Biol 120, Bot 104, CP electives
 4th Year: Ag 112, 130, 146, 151, CP 150

Horticulture

- 1st Year: Ag 1, H 11, 12, Biol 1B, Chem 2A-B, AgM electives
 2nd Year: H 57, Bact 20, Bot 1, Chem 8, Econ 1A, AgM and H electives
 3rd Year: Ag 106, 114, 136, V 11 or 16, Biol 120, Bot 104
 Summer: H 112
 4th Year: Ag 130, 146, 151, H 181, 186

Ornamental Horticulture

- 1st Year: Ag 1, OH 22, Biol 1B, Chem 2A-B, AgM electives
 2nd Year: OH 33, 53, Bact 20, Bot 1, Chem 8, Econ 1A
 3rd Year: Ag 106, 136, 159, OH 123, 132, Biol 120, Bot 104
 4th Year: Ag 31, 130, 146, OH 125, 162, 163

Viticulture and Enology (Enology Option)

- 1st Year: Ag 1, Biol 1A, Chem 2A-B, Math B
 2nd Year: V 15, Acct 1A-B, Bact 20 or 54, Chem 8, 109, Econ 1A-B
 Summer: V 50
 3rd Year: V 115, 116, 158A or 171, 158B or 160, Chem 105, Physics 2A-B
 4th Year: V 160 or 158B, 171 or 158A, Bus Ad 110, V electives

Viticulture and Enology (Viticulture Option)

- 1st Year: Ag 1, V 11, 16, Biol 1B, Chem 2A-B, AgM electives
 2nd Year: V 13, 110, Bact 20, Bot 1, Chem 8, Econ 1A, AgM elective
 Summer: V 50
 3rd Year: Ag 106, 136, H 11 or 12, V 101, Biol 120, Bot 104
 4th Year: Ag 130, 146, 151, V 15, 166, 170

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.

AGRONOMY**CP 11. Introduction to Agronomy (3)**

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)

CP 12. Introduction to Vegetable Crops (3)

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)

CP 51. Forage Crops (3)

Prerequisite: CP 11 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)

CP 52. Fiber and Oil Crops (3)

Prerequisite: CP 11. Fiber and oil crops, cotton, flax, ramie, castor bean, safflower, common to the San Joaquin Valley; cotton production; varieties and improvement, cultural methods, harvesting and marketing. (2 lecture, 3 lab hours)

CP 53. Cereal Crops (3)

Prerequisite: CP 11. Cereal crops common to the San Joaquin Valley; varieties and cultural practices, harvesting and marketing. (2 lecture, 3 lab hours)

CP 56. Vegetable Field Crops (3)

Prerequisite: CP 12. Methods of production, harvesting, grading, storing, and processing vegetable crops common to the San Joaquin Valley; potatoes, tomatoes, sweet potatoes, carrots, melons, and lettuce. (2 lecture, 3 lab hours; 3-day field trip)

CP 60. Weeds (3)

Prerequisite: CP 11. Weeds common to the San Joaquin Valley and their prevention and control; weed identification and recommended methods of control or prevention. (2 lecture, 3 lab hours; 1 week-end field trip)

CP 103. Seed Production (3)

Prerequisite: CP 11 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)

CP 105. Cotton Technology (3)

Prerequisite: CP 52 or equivalent. Cotton harvesting, processing, marketing, utilization, and testing; cotton fiber technology. (2 lecture, 3 lab hours)

CP 118. Range Management (3)

Prerequisite: CP 11 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)

CP 150. Crop Breeding (3)

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

CP 152. Cotton Classing (2)

Characteristics of classes and grades of cotton; practical work in classing cotton; cotton quality as related to grade, staple, and utilization. (1 lecture, 3 lab hours)

CP 190. Independent Study (1-3; max see reference)
See Regulations and Procedures—Independent Study.

HORTICULTURE

H 11. Introduction to Fruit Growing (3)

Varieties, adaptation, pruning, and cultural requirements of deciduous fruits; harvesting and preparation for market. (2 lecture, 3 lab hours; 16 hours additional pruning practice arranged)

H 12. Fruit Production (3)

Prerequisite: permission of instructor. Production of fruits and nuts in the San Joaquin Valley; spring orchard practices, laying out, planting and planning orchards on the college farm. (2 lecture, 3 lab hours; 2 Saturday field trips)

H 52. Citrus Production (3)

Survey of citrus industry; cultural operations including management practices in budding, planting, grafting, fertilizing, irrigating, controlling diseases, pruning, spraying, and harvesting the crop. (2 lecture, 3 lab hours; one Saturday field trip)

H 55. Subtropical Horticulture (3)

Prerequisite: H 11. Problems in production of citrus fruits, figs, olives, avocados, pomegranates, and persimmons. (2 lecture, 3 lab hours)

H 57. Fruit Varieties (3)

Prerequisite: H 12 or permission of instructor. Characteristic differences of fruit species; varieties produced in the San Joaquin Valley. (2 lecture, 3 lab hours)

H 58. Small Fruit Culture (3)

Cultural practices in production of strawberries and small fruits; berry culture management practices, pruning, planting; insect pest and disease control; practical experience in harvesting, grading, and marketing berries. (2 lecture, 3 lab hours)

H 112. Marketing Fresh Fruit (3)

Prerequisite: H 11, 12. Practice in harvesting, grading, sorting, and packing fruit; operation of packing house, selection and use of equipment; inspection and marketing of packed fruit. (3-day field trip)

H 181. Fruit Processing (3)

Prerequisite: H 11. Grading of fruits and nuts, packaging, drying, and quick freezing; improvement of produce, laws in maintaining fruit standards. (2 lecture, 3 lab hours)

H 186. Orchard Management (3)

Prerequisite: H 57, 112 or permission of instructor. Principles and practices of orchard management; appraisal; farm contracts and leases. (2 lecture, 3 lab hours)

H 190. Independent Study (1-3; max see reference)

See Regulations and Procedures—Independent Study.

ORNAMENTAL HORTICULTURE

OH 3. Fundamentals of Plant Propagation (3)

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

OH 22. Principles of Landscape Gardening (3)

Planting and maintenance of the garden; selection, planting, fertilization, irrigation, pruning of plant material; 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)

OH 33. Plant Identification and Materials (3)

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)

OH 53. Principles of Nursery Practice (3)

Prerequisite: OH 3. 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)

OH 123. Production of Ornamentals (3)

Prerequisite: OH 53, Bot 1. Production of ornamental trees, shrubs, vines and groundcovers by cuttings, budding, grafting, layerage, separation and division; lining out, balling, bare rooting, canning, growing of cutting material, growing liners; pruning and training espaliers, specimen plant production. (2 lecture, 3 lab hours; one all-day field trip)

OH 125. Ornamental Trees (3)

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

OH 132. Turfgrass Production and Management (3)

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)

OH 162. Nursery Management (3)

Prerequisite: OH 22, 33, 123. Design, construction and utilization of nursery structures; control of temperatures and lighting; business organization. (2 lecture, 3 lab hours)

OH 163. Farm and Home Landscaping (3)

Prerequisite: OH 22, 33, 123, 125. Arrangement, planning, planting the farmstead; arrangement and care of selected adapted ornamentals; layout, design and installation from plans. (2 lecture, 3 lab hours; 2 all-day field trips)

OH 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

VITICULTURE AND ENOLOGY**V 11. Grape Production (3)**

Production of grapes; structure, physiology, and climatic requirements of the vine; fall budding, pruning, raisin drying; practice in fall cultural operations. (2 lecture, 3 lab hours)

V 13. Raisin Production and Processing (2)

Prerequisite: V 11 or permission of instructor. Principles and practices of raisin production and processing operations. The college vineyard and raisin processing laboratory will be utilized. (1 lecture, 3 lab hours)

V 15. Introduction to Enology (3)

History and development of the wine industry; mechanics of various processes and factors involved in wine making.

V 16. Vineyard Operations (3)

Application of spring vineyard operations; laying out a vineyard, planting, trellising, training young vines, thinning, girdling; and grape propagation, cuttings, rootings, grafting (cleft, notch, bench, and green); T-budding and spring care of fall budded vines. (2 lecture, 3 lab hours)

V 50. Grape Varieties (3)

Prerequisite: V 11. Grape varieties common to California; rootstocks and species, identification, adaptability, and use.

V 101. Processing and Marketing Grapes (3)

Prerequisite: V 11, 50, Econ 1A. Processes in preparing grapes for market, marketing procedures; grape processing plants, and grape and raisin marketing centers. (2 lecture, 3 lab hours; 3-day field trip)

V 110. Grape Diseases and Pests (3)

Prerequisite: Ag 106, V 11. Grape diseases and pests; identification and control; application of sprays, insecticides; establishment of control programs. (2 lecture, 3 lab hours)

V 115. Winery Practices (4)

Prerequisite: V 15, 50, Chem 109, Bact 20 or 54. Principles and practices of preparation of dessert and table wines; operation of plant equipment; controlled tests; sanitation and waste disposal problems. (2 lecture, 6 lab hours)

V 116. Advanced Winery Practices (5)

Prerequisite: V 115. Winery operations; quality control and production of specialty products; laboratory tests for aldehydes and esters, copper and iron, pasteurization and fining; microbiological techniques. (3 lecture, 6 lab hours)

V 158A-B. Unit Operations I and II (3-3) (158A same as AgM 158)

Not open to students with credit in E 151A-B. Prerequisite: permission of instructor. Basic principles of industrial operations as they apply to the wine industry with application to chemistry and physics, transformation of energy, heat transfer, and flow of fluids; application of principles as they apply to evaporation, heat exchange equipment, distillation and drying. (158A: 2 lecture, 3 lab hours)

V 160. Winery Technology (3)

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)

V 166. Vineyard Management (3)

Prerequisite: V 15, 101. Management of vineyards in the San Joaquin Valley; coordination of production and marketing, cost studies, and planning an economical vineyard. (2 lecture, 3 lab hours)

V 170. Viticulture Seminar (1; max total 2)

Open to seniors majoring in viticulture and enology. Latest developments in research; assigned research paper in viticulture or enology to be presented in both oral and written form.

V 171. Winery Management (3)

Prerequisite: permission of instructor. Physical properties of a winery; administrative organizational set-up; personnel; purchasing, packaging, and shipping; local, state, and federal regulatory statutes.

V 190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

SCHOOL OF ARTS AND SCIENCES

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SCHOOL OF ARTS AND SCIENCES

Dale C. Burtner, Dean

Assistants to the Dean Russell E. Leavenworth
James H. Winter

<i>Department</i>	<i>Chairman</i>
Anthropology-Sociology	William C. Beatty, Jr.
Art	Frank B. Laury
Biology	Keith H. Woodwick
Chemistry	Richard P. Ciula
Economics	Richard C. Spangler
English	Robert S. Billings
Foreign Language	Edgar A. List
Geography	Chester F. Cole
Geology	C. Noble Beard
History	Jose C. Canales
Mathematics	Thomas C. Kipps
Music	Ralph C. Rea
Philosophy	Robert L. Mathers
Physical Education and Recreation	Cecil N. Coleman
Physics	Frederic A. Scott
Political Science	Karl E. Buckman
Psychology	Stanley E. Lindquist
Speech Arts	Phillip N. Walker

The School of Arts and Sciences, as the academic core of the college, provides a complete spectrum of the academic disciplines normally found in a liberal arts college. The broad fields covered include fine arts, humanities, natural sciences, social sciences, and physical education. Instruction in these areas is designed with two primary aims: that of producing a liberally educated person, one who will take his place in society with independence of mind and a devotion to free inquiry; and that of professional training in depth for those who wish to pursue one of these disciplines as a life's work.

The school discharges these two obligations by providing the major portion of the college general education program and by providing both graduate and undergraduate majors or fields of concentration in its various departments and in certain interdisciplinary areas. Students seeking career and educational information related to the School of Arts and Sciences are urged to consult directly those identified with the area of interest.

ANTHROPOLOGY-SOCIOLOGY DEPARTMENT

Professors: W. Beatty (Chairman), Dienststein, Wang

Assistant Professors: D. Brewer, Kenyon, Mark

Lecturer: McGee

Part-time: R. Allen, Gaudin, Latham, J. Vavoulis, Wren

The department offers majors for bachelor of arts degrees in anthropology and sociology and a combined sociology-anthropology minor for students majoring in other departments. The majors are 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. (See *History Department—Asian Studies*).

FOREIGN LANGUAGE REQUIREMENT

Two years of satisfactory collegiate study (or equivalent) in one modern foreign language are required of majors in anthropology and sociology. Reading knowledge of the language is emphasized. See the general statement in section on *Degrees and Credentials—Foreign Language Requirement* for equivalents and alternative ways of meeting the requirement.

MAJORS

The following degree major requirements are in addition to the general education requirement in social science.

Anthropology	<i>Units</i>
Anthro 1, 2, 115, Soc 153.....	12
Anthropology electives (ud).....	12
Elect from: Soc 152, 155, 157, 175.....	6
Elementary statistics; Ling 135, 139T, Biol 120.....	12
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Additional Requirements: Soc 1A, Biol 1B.

Sociology	
Anthro 2, 104.....	6
Soc 1A-B, 153, 175, 176.....	15
Sociology electives (ud).....	18
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MINOR

The following minor requirements are in addition to the general education requirement in social science.

Sociology-Anthropology	
Elect one group: Anthro 1, 2, 104; or Soc 1A-B, 152 or 155.....	9
Electives in anthropology and sociology (ud).....	9
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CREDENTIAL PROGRAM

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

*Courses***ANTHROPOLOGY****1. Introduction to Physical Anthropology (3)**

May not be used to meet general education requirements in social science. 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.

102. Ethnology (3)

Prerequisite: Anthro 2 or permission of instructor. Major theories of culture; survey of culture types and their distribution; ethnological problems.

103. Acculturation (3)

Prerequisite: Anthro 2 or permission of instructor. Impact of western civilization upon nonwestern societies; social and cultural adjustments to impact; disintegration; reinterpretation, and reintegration; place of anthropology in international relations and colonial administration.

104. Social Anthropology (3)

Prerequisite: Anthro 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.

105. The American Indian (3)

Prerequisite: Anthro 2 or permission of instructor. Prehistory of western hemisphere; linguistic groups; development, spread, and attainments of native Indian cultures.

107. Civilizations of Southeast Asia (3)

Not open to students with credit in Hist 105B or 107. History and culture of Southeast Asia from earliest times to the present.

108. Civilizations of East Asia (3)

Not open to students with credit in Hist 105A or 108. History and cultures of China, Japan, and Korea from earliest times to the present.

109. History and Theory of Archeology (3)

Prerequisite: Anthro 1 or permission of instructor. Development of archeology; theoretical background and basis.

110. Archeological Methods (3)

Prerequisite: Anthro 1, 2, 109, or permission of instructor. Practical work on excavation; use of various instruments employed by excavator; keeping field records; dating methods. (1 lecture, 4 lab hours)

114. Culture and Personality (3)

Prerequisite: Anthro 2 or 6 units of sociology, social welfare, or psychology; permission of instructor. Cross-cultural range in variation of personality and its theoretical implications; process of cultural and social conditioning in personality development; enculturation and motivation theories; ethnoscience.

115. Method and Theory in Cultural Anthropology (3)

Prerequisite: Anthro 2. Reading and analysis of major contributions to cultural anthropological thought.

SOCIOLOGY**1A-B. Principles of Sociology (3-3)**

(A) Principal concepts and problems, including personality, social groups, social change and social processes. (B) Prerequisite: Soc 1A. Analysis of conditions in society regarded as disruptive of the social order and subject to remedial action.

111. Sociology of Minority Relations (3)

Prerequisite: Soc 1A or Anthro 2, or 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 and Mass Culture (3)

Prerequisite: Soc 1A or permission of instructor. Unstable social collectives; crowds, audiences, mobs and popular movements; processes of dissemination of rumors, rise and decline of popular tastes, manipulation of sentiment, tension release in modern society.

145. Social Organization (3)

Prerequisite: Soc 1A or permission of instructor. Significant types of organizations in American society; their place in the social system, organizational structure, internal processes.

147. Medical Sociology (3)

Prerequisite: Soc 1A or permission of instructor. Analysis of the social and cultural dimensions of health, sickness, and organized medical care.

151. Social Stratification and Mobility (3)

Prerequisite: Soc 1A or permission of instructor. Classic and recent studies of social class and mobility, critical analysis of research methods; social class and mobility aspirations of the individual in society.

152. History of Social Thought (3)

Prerequisite: Soc 1A or permission of instructor. Leading social thinkers of the Western World from Plato to Comte; comparative study of social philosophers of the East.

153. Modern Sociological Theory (3)

Prerequisite: Soc 1A-B. Contemporary sociological theories; analytical, social action, and functional theories, including conceptualization.

155. Social Institutions (3)

Prerequisite: Soc 1A or permission of instructor. Major social institutions—familial, economic, political, educational, religious; origin and development; functions and interrelationships in contemporary phases of development.

157. Social Change (3)

Prerequisite: Soc 1A or permission of instructor. Social dynamics; factors and forces underlying social change; process of social change; direction of social change.

159. Sociology of Religion (3)

Prerequisite: Soc 1A or permission of instructor. Examination of the relationship between the sacred and the secular; functioning of religious values, practices, and organization in society.

161. Population (3)

Prerequisite: Soc 1A or permission of instructor. Population distribution, density, growth; age, sex, ethnic composition; population theories; impact of population changes on modern society.

162. Psychological Sociology (3)

Prerequisite: Soc 1A or permission of instructor. Relation of the individual to his sociocultural environment, with special reference to personality development, interpersonal role behavior, and social control.

163. Urban Sociology (3)

Prerequisite: Soc 1A 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.

165. The Family (3)

Prerequisite: Soc 1A or permission of instructor. Nature, historical development, and contemporary trends of the modern family.

175. Sociological Research Methods (3)

Prerequisite: Soc 1A or permission of instructor. Methods in sociological-anthropological research.

176. Advanced Sociological Research Methods (3)

Prerequisite: Soc 175 and at least one course in statistics. Systematic exploration of survey research methods; application of general methodological principles to the particular operating context of a survey.

190. Independent Study (1-3; max see reference)

See Regulations and Procedures—Independent Study.

ART DEPARTMENT

Professor: Musselman

Associate Professors: Laury (Chairman), W. Williams

Assistant Professors: Aiken, R. Delaney, Kusel, Lund, Maughelli, McDougall, Minschew, Oppen, Smalley, G. Thompson

Part-time: Bertoldi, Bitters, Hopper, J. Laury, McCoon, Moore, Odorfer, Renzi, E. Smith, Statham, Willett, Williamson

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. (See *History Department—Asian Studies*).

MAJOR

The major in art consists of 39 units in required courses, of which 24 must be upper division.

	<i>Units</i>
Art 2, 3 (taken concurrently); 9, 11, 14, 18, 50.....	15
Art 118, 119 (6 units), 131 or 132, 133 (mixed media only), 144, 150.....	17
Approved electives in art (ud)	7
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MINOR

The minor in art consists of 21 units in required courses as listed.

Art 2, 3 (taken concurrently); 9, 11, 14, 50.....	13
Art 119	3
Approved electives in art (ud)	5
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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 ARTS DEGREE

The graduate program for the master of arts degree in art is separate from the credential program and requires a minimum of 30 semester units beyond the baccalaureate degree. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

Courses**ART****2. Man and Expression (2)**

Taken concurrently with Art 3. Required of all art majors and minors. Artistic behavior related to innovation, creative problem solving, concepts of design, and cultural influences on the artist.

3. Color and Design (3)

Open to general education students. Relationships of materials, media, expression and ideas and their effects on contemporary art. (3 2-hour lecture-labs; field trips)

4. Contemporary Influences in Art (2)

Open to general education students. Function and character of art as an integral force in contemporary society; critical appreciation of aesthetic factors and contemporary trends in painting, sculpture, graphic arts, architecture, design for mass production, and arts of individual craftsmen.

9. Lettering and Layout (2)

Not open to students with 2 units credit in Art 7. Technical facility and appreciation of lettering and layout in the design of posters, books, periodicals, and advertisements. (2 2-hour lecture-labs)

11. Pottery (2)

Elementary building processes and surface treatments; firing, development and use of design criteria; history and appreciation of pottery. (2 2-hour lecture-labs)

14. Drawing and Composition (2)

Intensive study of drawing techniques in relation to the varied objectives of artists. (2 2-hour lecture-labs)

18. Figure Drawing (2; max total 4) (Former Art 18A-B)

Drawing from the model. (2 2-hour lecture-labs)

40. Visual Presentation and Display Concepts (1)

Prerequisite: sophomore standing. Current problems of effectively displaying all types of two- and three-dimensional material in the gallery and classroom; installing exhibits in the Art Department gallery. (1 2-hour lecture-lab)

50. Sculpture (2)

Concepts of sculpture; creative experimentation with materials and processes; design quality. (2 2-hour lecture-labs)

55A-B. Print Making (2-2)

Prerequisite: Art 3 or permission of instructor. (A) Exploration of various media in print making; present and past examples. (B) Concentrated study of one or more areas in print making. (2 2-hour lecture-labs)

101. Photography (2; max total 4 if no area repeated)

Outdoor and indoor photography; film and print development; design and interpretation of the photographic image. Some equipment provided. (1 lecture, 3 lab hours)

104. Art Education for the Secondary School (3)

Development of creative attitudes and philosophy of teaching art; research in the development of creative thinking and its implication for art education at the secondary level; current problems, adolescent and teenage art expressions, curriculum planning, observations, laboratory. (3 2-hour lecture-labs)

108. Costume Design (2)

Design and appreciation of personal adornment; sketching from draped material; fashion illustration; construction from original designs; historic costume; leaders in fashion field. (2 2-hour lecture-labs)

110. Pottery (2) (Former Art 111A)

Prerequisite: Art 11. Glaze calculation and experimentation; advanced work in pottery design and construction; use of the potter's wheel. (2 2-hour lecture-labs)

111. Ceramic Sculpture (2) (Former Art 111B)

Prerequisite: permission of instructor. Construction and firing of clay sculpture; appreciation of three-dimensional design. (2 2-hour lecture-labs)

112. Composition and Design (2)

Prerequisite: Art 3. Advanced problems in textile design and screen printing with dyes; three-dimensional design in advertising, exhibits. (2 2-hour lecture-labs)

114. Drawing and Painting: Oil (3)

Prerequisite: Art 3. Selecting, arranging and composing still life material; picture building in both traditional and contemporary methods; use of color and variety of techniques; head and figure painting. (3 2-hour lecture-labs)

115. Illustration (3; max total 6, for credential 3)

Prerequisite: Art 3, Art 18 or 118. Advanced advertising and illustration; problems from rough layouts to finished renderings for all phases of commercial art, book and magazine illustration; methods of reproduction and printing. (3 2-hour lecture-labs)

116. Watercolor Painting and Composition (3)

Prerequisite: Art 3. Exploration of contemporary watercolor techniques; approaches to picture building with still life, flowers, figures and other indoor material. (3 2-hour lecture-labs)

118. Life Drawing (2; max total 6) (Former Art 118A-B-C-D)

Figure composition and drawing from nude and costumed figures; charcoal, ink, and paint. (2 2-hour lecture-labs)

119. Art Appreciation and History (3; max total 12 if no area repeated)

Prehistoric to the 12th century; 12th century to present; 19th and 20th century; American Art; Oriental Art.

121. Color Photography (2; max total 4 if no area repeated)

Prerequisite: Art 101 or permission of instructor. Exposing color transparencies; photographic color printing; color theory and its applications in interpretative imagery. (1 lecture, 3 lab hours)

131. Outdoor Painting: Oil (2) (Former Art 131A)

Prerequisite: Art 114. Landscape composition and painting from local motifs on location and in the studio; various approaches and techniques. (2 3-hour lecture-labs)

132. Outdoor Painting: Watercolor (2) (Former Art 131B)

Prerequisite: Art 116. Similar to Art 131 (2 3-hour lecture-labs)

133. Advanced Painting and Composition (3; max total 9 if no media repeated)

Prerequisite: Art 114 or 116 or equivalent. Studio instruction in painting and composition: oil, opaque watercolor, mixed media. (3 2-hour lecture-labs)

135. Arts and Crafts in the Elementary School (3)

Not open to students with credit in Art 5 and 130. Recommended: E Ed 105. Creative and mental development of children in relation to school, home, and community; exploring art materials, significance to children; observation, laboratory work with children. (3 2-hour lecture-labs)

141. Motion Picture Photography (2)

Use of amateur motion picture equipment for production of simple instructional and experimental films in black and white and color; planning, lighting, exposing, editing, titling, and synchronizing sound. (1 lecture, 3 lab hours)

144. Crafts (2; max total 4 if different problem areas) (Former Art 144A-B)

Prerequisite: Art 3. Individual problems in contemporary crafts; design of utilitarian products; contemporary designer-craftsmen; basic experiences in wood, fabrics, paper, plastics, metals, glass, and experimental processes. (2 2-hour lecture-labs)

145A-B. Interior Design (3-3)

Prerequisite: Art 3. Recommended: Art 9. (A) Contemporary interior; designing, selecting and arranging furniture, color and texture, to create a functional and congenial atmosphere for modern living; period furniture styles in relation to present trends. (B) Advanced design problems in decoration of rooms for restaurants, offices and stores; decoration of rooms in home and school social rooms. (3 2-hour lecture-labs)

150. Sculpture (2)

Prerequisite: Art 50 or permission of instructor. Structural and aesthetic considerations of sculpture as a contemporary art form. (2 2-hour lecture-labs)

180. Design in the Theatre (3) (See Drama 180)**190. Independent Study (1-3; max see reference)**

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

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 of specialization)

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 *Regulations and Procedures—Independent Study*.

299. Thesis or Project (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 or project for the master's degree.

IN-SERVICE COURSES

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

343. Contemporary Approaches in Art (1; max total 3)

BIOLOGY DEPARTMENT

Professors: Woodwick (Chairman), D. Falk, Hadsall, Hawbecker, McCoy,* Rees, Staebler

Associate Professors: Arce, J. Carr, Latimer, McClintic, P. Smith, Standing, Weiler

Assistant Professors: Burdick, Daubs, R. L. Evans, Harmon, Kieffer, Meyer, Pigg, Tribbey

Part-time: P. Anderson, Isaak, Hansen, Ishimoto, Myers, L. Smith, Toffoli, Torosian

The Biology Department includes the following fields: bacteriology, biology, botany, entomology, 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 the master of arts degree.

Five of the California State Colleges, including Fresno State College, 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 Biology Department. See *Special Programs—Moss Landing Marine Laboratories*; course descriptions follow Zoology courses.

PREPROFESSIONAL PREPARATION

For preprofessional program in dentistry and medicine, see *Preprofessional Preparation*.

FOREIGN LANGUAGE REQUIREMENT

Two years of satisfactory collegiate study (or equivalent) in one foreign language are 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 36 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 biology.

* Deceased

Biology Major for BA	<i>Units</i>
Bot 1 or equivalent.....	3-5
Zool 1 or equivalent.....	3-5
Biol 120	3
Field course in biological science (see below).....	3
Biological science electives (incl 7 units in botany and 7 units in zoology-entomology-physiology)	24-28
	<hr/> 40

Additional Requirements: 12 units physical science including chemistry and physics. (Recommended: Chem 2A-B, 8, 109; Physics 2A-B; Geol 1.) 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.

Botany Major for BA	
Bot 1	5
Biol 120	3
Biological science electives.....	6
Botany electives (ud).....	22
	<hr/> 36

Additional Requirements: Zool 1; Chem (incl organic) 8-9 un; Physics 2A-B or Phy Sc 10. Recommended: a course in statistics or philosophy of science. See foreign language requirement.

Microbiology Major for BA	
Bact 54, 117, 118, 161, 185.....	22
Chem 28, 109, 128.....	9
Approved biological science electives.....	6
	<hr/> 37

Additional Requirements: Biol 1A or Bot 1; Chem 1A-B, 105; Physics 2A-B. See foreign language requirement.

Zoology Major for BA	
Bot 1, Zool 1, 160, 164; Zool 114 or Ent 101.....	18-21
Biol 120	3
Approved biological science electives (at least 6 units zoology-entomology-physiology)	12-15
	<hr/> 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 biology 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.

Biology Major for BS	Units
Bact 54, 117, 118, 185	18
Chem 150B	4
Physio 1	4
Zool 1, 108, 157, 158	16
	<hr/>
	42

Additional Requirements: Biol 1A; Chem 2A-B, 8, 105, 109, 150A.

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 Lang
 2nd Year: Physics 2A, Zool 1, F Lang
 (Recommended: Geol 1, Chem 8, Physics 2B)
 3rd & 4th Years:
 Biol 120; complete major requirements
 (Recommended: Chem 109)

Botany

1st Year: Bot 1, Zool 1, Chem 1A or 2A-B, F Lang
 2nd Year: Physics 2A-B or Phy Sc 10, Chem 8, F Lang
 3rd & 4th Years:
 Complete upper division botany courses, Biol 120, Biol Sc electives

Microbiology

1st Year: Bot 1 or Biol 1A, Chem 1A-B, F Lang
 2nd Year: Bact 54, Chem 28, 109, 128, F Lang, Physics 2A-B
 3rd & 4th Years:
 Bact 117, 118, 161, 185, Chem 105, Biol Sc electives

Zoology

1st Year: Zool 1, Chem 1A or 2A-B
 2nd Year: Bot 1, Physics 2A-B, Chem 8, Biol 120, F Lang
 3rd & 4th Years:
 Major electives Ent 101 or Zool 114, F Lang, 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*.)

Biology

1st Year: Zool 1, Biol 1A, Chem 2A-B
 2nd Year: Bact 54, Zool 108, Chem 8, 109, Physio 1
 3rd & 4th Years:
 Bact 117, 118, 185, Zool 157, 158, Chem 105, 150A-B

BIOLOGY MINOR

The biology minor consists of 20 units of which 6 must be upper division.

	<i>Units</i>
Biol 1A-B or 2A-B	6
Biol 112 or an approved field course (see below)	3
Biological science elective (3 units u.d.)	11
	20

Approved Field Courses: Biol 112, 133, 208, Bot 106, 107, Ent 101, Zool 113, 114, 134, 135, 137, 138, 140, 165.

Additional Requirements: physical science including chemistry and physics. (Recommended: high school chemistry or Chem 2A-B; high school physics or Phys Sc 10.)

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 biology is based on the equivalent of a Fresno State College undergraduate major in biology, botany, microbiology, or zoology. Eighteen of the 30 units required for the degree must be in biological science and must include Biol 200 or 206. 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.

FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of arts degree requires the passing of an examination demonstrating the ability to read materials of the major in one appropriate foreign language.

*Courses***BACTERIOLOGY****20. General Microbiology (4)**

Prerequisite: Chem 2A-B; one of the following—Biol 1A, 2A-B, Bot 1 or Physio 1. General survey of the field of microbiology; principles and selected practical applications. (2 lecture, 6 lab hours)

54. Bacteriology (5)

For majors. Prerequisite: organic chemistry; Biol 1A or Bot 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: Bact 54, Chem 8. Principles and applications of plasma changes in presence of antigens. (2 lecture, 6 lab hours)

118. Bacteriology of Human Disease (5)

Prerequisite: Bact 54, 117, Chem 8. Bacterial, mycotic and viral etiological agents of human disease. (3 lecture, 6 lab hours)

161. Microbial Physiology (4)

Prerequisite: Bact 54, Chem 8. Structure and physiological functions in the bacterial cell. (2 lecture, 6 lab hours)

185. Virology (4)

Prerequisite: permission of instructor. Biological and chemical aspects of viruses. Technique of viral cultivation, detection, and assay; illustration of principles. (2 lecture, 6 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

BIOLOGY

Note: College biology equivalents include Biol 1A or Bot 1 and Biol 1B or Zool 1; Biol 2A-B.

1A. Plant Biology (3)

Not open to students with credit in Biol 2A or Bot 1. Structure, function, ecology, and economic study of plants including heredity and evolution. (2 lecture, 2 lab hours)

1B. Animal Biology (3)

Not open to students with credit in Biol 2A or Zool 1. Structure, function, ecology and economic study of animals; physiology as applied to man. (2 lecture, 2 lab hours)

2A. Life Science (3)

Not open to students with credit in Biol 1A, 1B, Bot 1 or Zool 1. Principles of biology related to the cell, maintenance, and relation of living organisms, heredity and elementary processes of evolution. (2 lecture, 2 lab hours)

2B. Life Science (3)

Prerequisite: Biol 2A. Principles of biology related to reproduction, mechanisms of evolution, diversity of life, populations and communities, biogeography, history of life. (2 lecture, 2 lab hours)

66. General Human Anatomy (3)

Recommended: an introductory college biology course. Structure of the human body. (2 lecture, 3 lab hours)

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: Biol 1A-B, 2A-B or equivalent. Local environmental and biotic interdependencies. (2 lecture, 3 lab or field hours)

116. Microscopic Technique (3)

Prerequisite: 3 units of biology. Preparation of plant and animal tissues for microscopic study. (9 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)

133. Aquatic Biology (3)

Prerequisite: one year college biology, one semester college chemistry. Geology, chemistry, physics of inland waters as related to biology; community structure, ecological interactions, adaptations, and identification of aquatic organisms. (2 lecture, 3 lab or field hours)

151. Heredity and Evolution (3)

Not open to students with credit in Zool 175 or Biol 120. Prerequisite: Biol 1B, 2A-B or equivalent. Heredity of man and principles of organic change.

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)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

200. Principles and Great Experiments in Biology (2)

Development and influence of current biological thought.

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)

255. Topics in Botany (2; max total 6)

Prerequisite: permission of instructor. Investigation of selected areas in the field of botany.

258. Experimental Virology (3)

Prerequisite: permission of instructor. Experimental procedures used in bacteriophage and animal virus research; collection, interpretation and presentation of data.

259. Experimental Infectious Pathology (3)

Prerequisite: permission of instructor. The production and study of tissue changes resulting from infection with pathogenic microorganisms.

260. Topics in Microbiology (2; max total 6)

Prerequisite: permission of instructor. Intensive investigation of selected areas in microbiology.

265. Topics in Physiology (2; max total 6)

Prerequisite: permission of instructor. Investigation of selected areas in the field of physiology.

270. Topics in Zoology (2; max total 6)

Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area; topics may include animal behavior, taxonomic methodology, taxonomy of immature insects, experimental embryology.

281. Seminar in Biological Science (1; max see below)

Maximum total credit 5 units; not more than 2 units in each field. Prerequisite: one of the majors in the Biology Department. Reviews and reports on recent literature and problems in biology, botany, entomology, microbiology, and zoology.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

302. Topics in Biology (3; max total 6)**BOTANY**

Note: College botany equivalents include Bot 1, Biol 1A, Biol 2A-B.

1. General Botany (5)

Not open to students with credit in Biol 1A. Prerequisite to most upper division botany courses. Fundamentals of structure and function in seed plants; survey of plant kingdom. (3 lecture, 6 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)

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)

140. General Mycology (4)

Prerequisite: college botany, Bot 135, 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 *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

ENTOMOLOGY**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 Ag 106)

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 *Regulations and Procedures—Independent Study*

200 series. Graduate courses are listed under *Biology*.

PHYSIOLOGY**1. Human Physiology (4)**

Prerequisite: one year of college chemistry and a college biology course, Biol 66 recommended. Detailed study of the functions of the human body. (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 *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

ZOOLOGY

Note: College zoology equivalents include Zool 1, Biol 1B, Biol 2A-B.

1. General Zoology (5)

Not open to students with credit in Biol 1B. Prerequisite to most upper division courses in zoology. Survey of major phyla and principles of animal biology. (3 lecture, 6 lab hours)

103. Vertebrate Zoology (3)

Not open to students with credit in Zool 164. Prerequisite: college zoology. Study of the vertebrates. (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, permission of instructor. Vertebrate classes; natural history of local species. (3 lecture, 3 lab or field hours)

114. Advanced Invertebrates (3)

Prerequisite: college zoology. Invertebrates exclusive of insects, parasitic protozoa and helminths. (2 lecture, 3 lab or field hours)

134. Wildlife Management (3)

Prerequisite: college zoology. Relation of vertebrates to human affairs. (2 lecture, 3 lab or field hours)

135. Mammalogy (4)

Prerequisite: college zoology. Mammals of the world with emphasis on local species. (3 lecture, 3 lab or field hours)

137. Herpetology (4)

Prerequisite: college zoology, permission of instructor. Reptiles and amphibians of the world with emphasis on local species. (3 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 (4)

Prerequisite: college zoology, permission of instructor. Identification, natural history, distribution, ecology, and management of fishes; freshwater fishes of California, native and introduced. (3 lecture, 3 lab or field hours)

157. Histology (4)

Prerequisite: college zoology. Identification and study of vertebrate cells, tissues, and organs. (2 lecture, 6 lab hours)

158. Elementary Hematology (3)

Prerequisite: Physio 1 or Zool 157. Identification of blood cells and practice in hematological procedures. (1 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 (4)

Prerequisite: college zoology, permission of instructor. Introduction to the identification and natural history of birds with emphasis on local species. (3 lecture, 3 lab or field hours)

175. Vertebrate Evolution (2)

Prerequisite: Biol 120 and a vertebrate field course. The course of evolution of the higher vertebrates including present concepts of speciation.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Biology*.

MOSS LANDING LABORATORY COURSES

Note: The following courses are offered at the Moss Landing Marine Laboratories. See Special Programs—Moss Landing Laboratories; see also Geol 109.

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 and field 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 and 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 of organisms within these environments. Emphasis on field observation, collection, identification, and systematics. (2 lecture, 6 lab and field hours)

131. Marine Algology (3)

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. (1 lecture, 3 lab and 6 field hours)

161. Marine Ecology (3)

Prerequisite: college biology. 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, 3 lab and field hours)

180. Special Problems in the Marine Sciences (1-3)

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, and 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 COURSE**298. Research in the Marine Sciences (1-3)**

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)

CHEMISTRY DEPARTMENT

Professors: Biggerstaff, Bremner, Clark, Kallo, Kauffman, Womack
Associate Professors: Ciula (Chairman), W. Miller
Assistant Professors: B. Benson, Bluestone, Gigliotti, Russell, Vavoulis
Part-time: Koligian, Kyle

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 Chemistry Department is approved by the American Chemical Society. Students who satisfactorily complete the program for the bachelor of science degree in chemistry 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 Colleges, including Fresno State College, 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 Chemistry 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 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.

MAJORS

For the bachelor of arts degree a major in chemistry consists of 37 units as listed below. For the bachelor of science degree, a major in chemistry consists of 46 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 and 61, or equivalent, are 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.

BACHELOR OF ARTS DEGREE IN CHEMISTRY

	<i>Units</i>
General Education	45
Chemistry Major	37
Chem 1A-B, 6, 28, 29, 106, 110A-B, 111A-B, 128, 129	
Additional Requirements	21
Math 75, 76, 77, Physics 2A-B	
Electives	21
Recommended: Chem 99	
	124

BACHELOR OF SCIENCE DEGREE IN CHEMISTRY

General Education	45
Chemistry Major	46
Elect 6 units from: Chem 115, 126, 130, 155, 160, 190 (3 un) or a 200 course	
Additional Requirements	30
German 61, Math 75, 76, 77, Physics 4A-B-C	
Physics 102 or other approved u.d. physics or mathematics course	
Electives	7
German 1A-B or equivalent required if not taken in high school	
Recommended: Chem 99	
	128

MINOR

A minor in chemistry for a bachelor's degree requires 19 to 24 units, of which 6 are upper division.

Chem 1A-B; or 2A-B and 101; or 2A-B and 150A-B	9-14
Chem 8, 105, 109	10
	19-24

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 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 College. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

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.

Courses**CHEMISTRY****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 or Math 28 (concurrently). 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)

6. Quantitative Analysis (4)

Prerequisite: Chem 1B. Introductory principles and methods of quantitative analysis. (2 lecture, 6 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. Lectures, discussions, and demonstrations of fundamental principles; structure and chemical behavior of organic compounds.

28. Introductory Organic Chemistry (3) (Former Chem 128A)

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. Introductory survey of the reactions of principal functional groups; natural products.

29. Introductory Organic Chemistry Laboratory (2) (Former Chem 129A)

(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 gases, liquids, solutions, buffers, conductance, electromotive force cells, reaction kinetics, colloidal systems, radioactivity, nuclear fission. (3 lecture-demonstration hours)

105. Quantitative Analysis (4)

Not open to chemistry majors. Prerequisite: Chem 1B or 2A-B. Rapid coverage of principles and methods of volumetric and gravimetric analysis. (2 lecture, 6 lab hours)

106. Analytical Chemistry (4)

Prerequisite: Chem 110A, 111A; concurrently Chem 110B, 111B. Principles and methods of qualitative and quantitative analysis of inorganic and organic substances, including an introduction to instrumental analysis. (2 lecture, 6 lab hours)

109. Elementary Organic Chemistry Laboratory (3)

Not open to chemistry majors. Prerequisite or concurrently: Chem 8. Laboratory study of the carbon compounds with coordinating lectures. (1 lecture, 6 lab hours)

110A-B. Physical Chemistry (3-3)

Prerequisite: Chem 6 or 105, 8 or 28; Physics 4A and B or C, or 2A-B; Math 77. Fundamental laws and theories.

111A-B. Physical Chemical Measurements (1-2)

Accompanies Chem 110A-B. (3 or 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.

121. Inorganic Preparations (3)

Prerequisite: Chem 6 or 105. Preparation of inorganic compounds; development of technique, use of laboratory instruments; correlation of theory with practice; current literature. (1 lecture, 6 lab hours)

122. Advanced Inorganic Chemistry (3) (Former Chem 120)

Prerequisite: Chem 110A, 111A; concurrently Chem 110B, 111B. General principles; structural and descriptive inorganic chemistry; correlation between observed characteristics and more fundamental properties. (2 lecture, 3 lab hours)

126. Instrumental Methods of Analysis (3)

Prerequisite: Chem 110A, 111A (concurrently). Physical and instrumental methods of analysis of inorganic and organic substances; instrumental design. (1 lecture, 6 lab hours)

128. Intermediate Organic Chemistry (3) (Former Chem 128B)

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) (Former Chem 129B)

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 6, 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)

150A. General Biochemistry (4) (Former Chem 151)

Prerequisite: Chem 8, 105, 109, and one year of general physics. Chemistry of carbohydrates, lipids, proteins, and biochemical regulators; digestion absorption, detoxication, and metabolism. (2 lecture, 6 lab hours)

150B. Clinical Biochemistry (4) (Former Chem 152)

Prerequisite: Chem 150A. Intermediary metabolism; clinical laboratory methods of analysis of tissues and body fluids and their diagnostic value. (2 lecture, 6 lab hours)

155. Modern Biochemistry (3)

Primarily for chemistry majors. Prerequisite: Chem 110B, 111B (or concurrently); 128, 129; year of general physics. Recent developments in characterization of carbohydrates, lipids, proteins, biochemical regulators; mechanism of intermediary metabolism and enzyme chemistry.

160. History of Chemistry (2)

Prerequisite: chemistry minor or equivalent and Chem 1A-B or 101. 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 *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

211. Chemical Thermodynamics (3)

Prerequisite: Chem 110A-B, 111A-B. Principles of thermodynamics; application to chemical problems; introduction to statistical methods, calculation of thermodynamic functions from spectroscopic data.

220. Theoretical Inorganic Chemistry (3)

Prerequisite: Chem 110A-B. Structure and bonding of inorganic and coordination compounds; valence bond, molecular orbital and ligand field theories; correlation of structure and reactivity.

226. Advanced Analytical Chemistry (3)

Prerequisite: Chem 110A-B, 111A-B. Theory, application, recent developments and literature of organic and inorganic analysis.

230. Advanced Organic Chemistry (3)

Prerequisite: Chem 128, 129. Synthesis of organic intermediates emphasizing structural theory and mechanism of reactions with references to current literature.

250. Topics in Advanced Chemistry (3; max total 6 if no area repeated)

Special topics in one of the areas of chemistry: analytical, biochemistry, inorganic, organic, physical.

280. Seminar in Chemistry (1; max total 2)**290. Independent Study (1-3; max see reference)**

See *Regulations and Procedures—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.

ECONOMICS DEPARTMENT

Professor: K. Falk, Mullennix

Associate Professor: Spangler (Chairman), Bush

Assistant Professors: Auchter, Minick, J. Shaw, Taniguchi

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 *History Department—Asian Studies*)

Foreign Language or Mathematics Requirement

The student must complete two years of satisfactory collegiate study or equivalent of one foreign language *or* a 14-unit mathematics sequence arranged with his economics adviser. Any student planning advanced study is advised also to meet the foreign language requirement of the school he plans to attend.

ECONOMICS MAJOR

The following bachelor of arts degree major requirements are in addition to the general education requirement in social science. All students majoring in economics must take a 3-unit statistics course in either the School of Arts and Sciences or the School of Business. Econ 1A and 1B are prerequisite to all upper division courses in economics except those offered in extension.

	<i>Units</i>
Econ 1A-B, 100A-B	12
Elect from: Econ 101, 110, 131, 135	6
Elect from: Economics (ud) not listed above, Bus Ad 152	12
	30

ECONOMICS MINOR

The minor in economics requires 18 units as listed below. In addition students must complete a 3-unit statistics course in either the School of Arts and Sciences or the School of Business.

Econ 1A-B, 100A or 100B	9
Elect from: Econ 101, 110, 111	3
Elect from: Economics (ud) not listed above	6
	18

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 ARTS DEGREE

The graduate program for the master of arts degree in economics is based on the equivalent of the undergraduate major at Fresno State College. For specific requirements, consult the head of the department; 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.

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in economics requires the passing of an examination demonstrating the ability to read materials of the major in one appropriate foreign language.

*Courses***ECONOMICS****1A. Principles of Economics (3)**

Not open to first-semester freshmen. 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)

Prerequisite: Econ 1A. 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.

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.

102. 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; senior standing or permission of instructor. Cyclical movements of business; history, characteristics and measurement; critical examination of business cycle theories and of proposals for reducing economic fluctuations.

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 and permission of instructor. Survey and analysis of developmental problems of emergent economies.

131. Public Finance (3)

Prerequisite: Econ 100A or permission of instructor. Governmental revenues and expenditures at federal, state, and local levels of jurisdiction.

135. Money and Banking (3)

Not open to students with credit in Bus Ad 135. Prerequisite: Econ 1A-B. 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, 100B, 135, 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, 100A or 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 150 or permission of instructor. Analytical topics from historical viewpoint; evolution of unions and labor legislation interpreted in terms of economic theory.

170. Transportation (3)

Prerequisite: Econ 1A-B. Economics of rail, water, motor, air, and pipeline transportation.

174. Government Regulation of Economic Activity (3)

Prerequisite: Econ 100A 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 100A or B or permission of instructor. International economic relations; problems and policies in the light of fundamental economic theory.

180. Comparative Economic Systems (3)

Prerequisite: Econ 100A or 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.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

Note: Econ 100A, 100B, and 135 are prerequisite to all graduate courses.

200. Seminar in Research Methodology (3)

Development and verification of hypotheses in economics; quantitative techniques.

201. Seminar in Economic Theory (3; max total 6)

Advanced topics in economic theory.

210. Seminar in Economic History of United States (3; max total 6)

Prerequisite: Econ 110 or permission of instructor. Critical examination of, and reports on, selected topics in the economic history of the United States.

231. Seminar in Public Finance (3)

Prerequisite: Econ 131. Advanced topics central to governmental expenditure, borrowing, and revenue collection.

236. Seminar in Monetary Theory (3)

Prerequisite: Econ 136 or permission of instructor. Advanced topics, reports, and critical examination of alternative theories and approaches to the study of money.

250. Seminar in Labor Economics (3)

Prerequisite: Econ 150 or permission of instructor. Advanced topics in wage and employment theory, philosophies of trade unionism, impact of collective bargaining on the modern industrial society.

278. Seminar in International Economics (3)

Prerequisite: Econ 178. Advanced topics in international economic theory, foreign exchanges, foreign investment, tariffs and international economics and economic development.

290. Independent Study (1-3; max see reference)

See Regulations and Procedures—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.

ENGLISH DEPARTMENT

Professors: Larrabee, Leavenworth, Lyon

Associate Professors: Billings (Chairman), Brengelman, Chittick, Levine, O'Neil, Poss, Zumwalt

Assistant Professors: Bluestein, Everwine, Gammon, Gatten, Geerdes, Hanzlicek, Hart, Holm-Hansen, Hopkins, Karr, Kausch, Logan, McKnight, Mezey, Page, Ries, Sibley, Stewart, Wakefield, Weihs

Instructor: M. Graham

Part-time: M. Allen, Butler, Haroian, Kellas, Peacock, R. Speer, B. White

The English Department offers a major in literature and language 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, literature, and linguistics. Tutorial hours are announced in the *Schedule of Courses*.

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 24 upper division units, including at least one course in English 193T, 194T, or Linguistics 139T. 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.

The courses listed below indicate the general approach to be taken in respect to a body of material. Consult the *Schedule of Courses* for the specific content of any section.

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 ARTS DEGREE

The graduate program for the master of arts degree in English is based on the equivalent of the undergraduate major at Fresno State College. The master of arts degree in linguistics is open to students with undergraduate majors in foreign language, English, anthropology, psychology, philosophy, mathematics, or 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 at Fresno State College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

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.

Courses

ENGLISH

Note: Courses in linguistics, formerly carried under anthropology and English, are listed under Linguistics following the courses in English below.

1. Composition and Reading (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; reading as a stimulus to thoughtful writing. Themes, chiefly expository or analytical; one paper based upon investigation of a selected topic.

6. Improvement in Reading Techniques (2)

Recommended for students who wish to improve their reading speed and comprehension. Analysis of reading habits; practice in efficient methods of reading and studying.

20. Introduction to Literature (3)

Prerequisite: Engl 1 or equivalent. Reading of literary masterpieces of various types, ages, and countries as the basis for class discussion of content, form, and theme and as a stimulus to critical writing.

40T. Writing (4; max total 8 if no topic repeated) (Former Engl 4, 10, 11)

Prerequisite: Engl 1, 20, or permission of instructor. Sections designated as emphasizing poetry, fiction, or essay writing; appropriate reading and analyses.

50T. Studies in Literature (4; max total 8 if no topic repeated)

Prerequisite: Engl 20. Sections designated as emphasizing certain writers or problems. Appropriate readings and analyses; critical writing.

134. Structure of English (3) (Same as Spch 134)

Not open to students with credit in English or Linguistics 135; not applicable to the English major. Empirical study of English phonology, morphology, syntax, spelling, and punctuation.

135. Introduction to Linguistics (3) (See Ling 135)

137. American English (3) (Former Ling 131) (Same as Spch 137)

Prerequisite: Engl 135. Empirical study of current American English, with reference to regional, institutional, and occasional variations.

138. History of the English Language (3)

Empirical study of the development of the sound system, grammar, and vocabulary of English.

139T. Studies in Linguistics (3; max total 15) (See Ling 139T)

149T. Advanced Writing (4; max total 12 if no topic repeated) (Former Engl 110, 111, 120)

Prerequisite: Engl 40T or permission of instructor. Sections designated as emphasizing poetry, fiction, or essay writing; appropriate readings and analyses.

159T. Literary History (4; max total 16 if no topic repeated) (Former Engl 100-105, 180-182)

Prerequisite: Engl 20 or equivalent. Sections designated as to period and nationality. Discussion and written analysis of major works and their backgrounds within approximately a century's scope.

169T. Forms of Literature (4; max total 12 if no topic repeated) (Former Engl 93)

Prerequisite: Engl 20 or equivalent. Sections designated as emphasizing poetry, drama, novel, or short story. Reading and close written analysis with particular attention to form.

190. Independent Study (1-4; max see reference)

See *Regulations and Procedures—Independent Study*.

193T. Seminar in Literary Studies (4; max total 12 if no topic repeated) (Former Engl 140-145, 182, 185)

Sections designated by topic. Individual projects. Reading, discussion, and writing of papers centered on short periods of literary history, particular literary themes, editorial problems, and other specialized investigations.

194T. Major Writers (4; max total 12 if no topic repeated) (Former Engl 160, 162A-B, 165. If Shakespeare, same as Speech 194T)

Studies and written analysis of the major works of a particular writer or a set of writers; Shakespeare, Chaucer, and Milton will be standard offerings in designated sections.

195. Senior Reading (4)

Reading in literature from a list prepared by the instructor in consultation with the student. Interpretative and analytical writing.

196. Senior Thesis (1-4; max total 4)

For seniors planning to obtain a master's degree in English. Writing an extended paper.

GRADUATE COURSES

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

200A-B. Graduate Survey (4-4)

Open only to second-semester seniors and graduates majoring in English. Extensive, individually directed readings in literature and related subjects.

210T. Seminar in Writing (4; max total 12, 8 max total in one area)

Prerequisite: permission of instructor. Advanced individual projects in writing; enrollments will be designated in poetry and fiction.

220T. Seminar in Rhetoric (4; max total 12 if no topic repeated)

Prerequisite: advanced composition or equivalent. Seminar in rhetorical theory in relation to social history; critical analysis of current rhetorical doctrine.

230T. Seminar in Linguistics (3; max total 12 if no topic repeated)

Prerequisite: Engl 135 or permission of instructor. Seminar in English and American linguistics.

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.

280T. Seminar in Literary Theory (4; max total 12 if no topic repeated)

Prerequisite: major or minor in English; permission of instructor. Seminar in literary criticism.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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.

IN-SERVICE COURSES

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

300. English Colloquium (2; max total 6)**LINGUISTICS****135. Introduction to Linguistics (3) (Same as Engl, Spch 135)**

Not open to students with credit in English 134. Introduction to descriptive and historical linguistics; relationships between language and culture.

139T. Studies in Linguistics (3; max total 15 if no topic repeated) (Same as Engl 139T)

Prerequisite: Ling 135. Sections designated as descriptive or historical.

FOREIGN LANGUAGE DEPARTMENT

Professors: Bird, Brenninger

Associate Professors: List (Chairman), Elgorriaga, Ensslin, Nagy

Assistant Professors: W. Bowen, Carnero, Cohee, Jasutis, Kinzel, Y. Lee, L. Lewis, McConnell, Pella, Poythress, Pronin, Tagliabue, Tucker

Part-time: Benitez, M. Bowen, Cabello, Erohina, Fouché, Hawkins, Glover, Khachadour, Negro, J. O'Neil, Petrosimo, Schumacher, Unruh

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.

CREDIT ALLOWANCE IN FOREIGN LANGUAGE

Students who wish to continue in a language taken in high school must take a placement test before enrolling. College credit may be earned in a class in which the student is placed. Consult the *Schedule of Courses* for dates of placement tests. See also *Degrees and Credentials—Foreign Language Requirement*.

MAJORS AND MINORS

The appropriate 1A-B courses or their equivalent are required for major and minor programs in French, German, and Spanish.

MAJORS

	<i>Units</i>
French	
Fr 2A-B, 109A-B, 112A-B	18
French electives (ud)	10
	—
	28
German	
Germ 2A-B, 115A-B, 116A-B	18
German electives (ud)	10
	—
	28
Russian	
Russ 1A-B, 2A-B	16
Russ 101, 110A-B, F Lang 118A-B (Russian)	21
	—
	37
Spanish	
Span 101, 102, 103A-B, 104A-B, 135	21
Spanish electives (ud)	9
	—
	30

MINORS

French	
Fr 2A-B	0- 6
Fr 50A-B, 101 (4 un), 137	11
Elect from: Fr 101, 109A-B, 112A-B	10- 4
	—
	21

	<i>Units</i>
German	
Germ 2A-B	0- 6
Germ 50A-B, 101 (4 un), 137	11
Elect from: Germ 101, 115A-B, 116A-B	10- 4
	—
	21
Latin	
Lat 1A-B, 3A-B	14
Lat 101A-B, 131 or 132	7
	—
	21
Russian	
Russ 1A-B, 2A-B	16
Russian electives (ud)	6
	—
	22
Spanish	
Span 2A-B	0- 6
Span 50A-B, 101, 102	10
Elect from: Span 103A-B, 104A-B, 135 or 137	6-12
	—
	22

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 ARTS DEGREE

The master of arts degree in foreign language 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 College. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

Courses

FOREIGN LANGUAGE

118A-B. Twentieth Century Literature (3-3; max total 6 in each language)

Analytical and critical study of twentieth century literary production of the country, excluding Spanish literature, through lectures in the target language (except Russian), outside readings, and one written report each semester in the language.

130A. Foreign Language in the Public School (3; max total see below)

May be taken for credit once in each language except Spanish. Open to secondary school student teachers. Intensive drill on phonetics for pronunciation, enunciation, intonation. (3 lecture, 1 lab hour).

130B. Foreign Language in the Elementary School (3)

Methods, materials, bibliography for teaching foreign language in the elementary school.

GRADUATE COURSES*(See Course Numbering System—Definitions and Eligibility)***200. Research Methods and Bibliography (2)**

Prerequisite: bachelor's degree in a foreign language or permission of instructor. Seminar in techniques of research; individual study, preparation of materials and their use for documentation in the language of specialization.

201. Foreign Language Linguistics (2; max total 4 if no language repeated)

Prerequisite: Latin 1B; major or minor in language of specialization; permission of instructor. Oppositions in language; phonetic and phonemic description; allophonic and phonemic perturbations; speech levels; dialects.

202. Seminar in Historical Linguistics (2; max total 4 if no language repeated)

Prerequisite: Latin 1B; major or minor in language of specialization; permission of instructor. Historical method; diachronic and synchronic considerations; language change; articulatory oppositions; Latin phonology and distributions; morphology, syntax; dialects; comparison with other Romance languages.

210. Seminar in Literary Studies (3; max total 12 if no topic repeated)

Prerequisite: equivalent of undergraduate major in language of specialization. Seminar in critique and analytical study of selected topics, periods, or specific literary figures.

290. Independent Study (1-3; max see reference)

See Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

301. Conversation and Composition Review (2; max total 8 if no language repeated)**304. Theory and Practice (2; max total 8)****FRENCH****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. (4 lecture, 1 lab hour)

2A-B. Intermediate French (3-3)

(A) Prerequisite: Fr 1B or two years of high school French. Grammar review; modern short stories or plays. Sight reading; weekly compositions; outside reading and reports. (B) Prerequisite: Fr 2A or three years of high school French. French civilization; selected poems; prose or dramatic works and one novel by French men of letters. Class discussion; occasional compositions; sight reading. Conducted in French.

50A-B. Oral French (2-2)

Prerequisite: Fr 1B; 2A or 2B (must be taken concurrently). Oral drill for pronunciation; conversation on assigned topics; brief talks; extemporaneous discussions. (2 lecture, 1 lab hour)

101. Composition and Conversation (2; max total 4)

Prerequisite: Fr 2B. Idioms; written translations into French; compositions on assigned topics; oral exercises. Emphasis on grammar and syntax.

102. Advanced Composition and Conversation (2; max total 4)

Prerequisite: Fr 101 (4 units) or permission of instructor. Emphasis on style in composition; written and oral reports on assigned topics.

109A-B. Survey of Literature, Earlier Period (3-3)

Prerequisite: Fr 2B. History of French literature, principal documents and authors from Chanson de Roland to André Chenier; renaissance, seventeenth and eighteenth centuries. Lectures and discussions; one paper each semester.

112A-B. Survey of Literature, Nineteenth Century (3-3)

Prerequisite: Fr 2B. Chief movements, works and authors from 1789 to the present; Romanticism, Realism, the Parnasse, Naturalism and Symbolism. Lectures and discussions; one paper each semester.

137. Applied Linguistics (3)

Prerequisite: Fr 101 (or concurrently); Ling 135. Phonological, morphological, syntactical, and lexical structure of French; conflicts with English structure; linguistics problems in design of teaching materials.

150A-B. The French Novel (2-2)

Prerequisite: Fr 2B. History of the novel in France from its origin to the present.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Foreign Language*.

GERMAN**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. (4 lecture, 1 lab hour)

2A-B. Intermediate German (3-3)

Prerequisite: Germ 1B or two years of high school German. Translation; sight-reading; conversation; grammar review.

50A-B. Oral German (2-2)

Prerequisite: Germ 1B. 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 passed with C or better. Selected readings in chemistry, geology, physics and mathematics for scientific vocabularies; use of standard periodicals.

101. Composition and Conversation (2; max total 4)

Prerequisite: Germ 2B. Idioms; written translations into German; compositions on assigned topics; oral exercises. Emphasis on grammar and syntax.

102. Advanced Composition and Conversation (2; max total 4)

Prerequisite: Germ 101 (4 units) or permission of instructor. Emphasis on style in composition; written and oral reports on assigned topics.

115A-B. Survey of Literature, Earlier Period (3-3)

Prerequisite: Germ 2B. Reading and discussion of representative selections from the *Nibelungenlied*, Wolfram, Gottfried, Luther, Lessing, Goethe, Schiller.

116A-B. Nineteenth Century Literature (3-3)

Prerequisite: Germ 2B. Reading and discussion of representative selections from Tieck, Eichendorff, Hoffmann, Grimm, Kleist, Heine, Grillparzer, Keller, Hauptmann, Sudermann.

137. Applied Linguistics (3)

Prerequisite: Germ 101 (or concurrently); Ling 135. Phonological, morphological, syntactical, and lexical structure of German; conflicts with English structure; linguistic problems in design of teaching materials.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Foreign Language*.

ITALIAN**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. (3 lecture, 2 lab hours)

2A-B. Intermediate Italian (3-3)

Prerequisite: Italian 1B or equivalent. (A) Review of grammar and syntax; composition; oral practice, reading of short stories and plays. (B) Oral and written composition; reading of short stories, novels, biographies. Conducted in Italian.

LATIN**1A-B. Elementary Latin (4-4)**

(A) Elements of Latin grammar; acquisition of reading ability. (B) Continued emphasis on reading ability through use of adopted selections from classical writers.

3A-B. Intermediate Latin (3-3)

(A) Prerequisite: Lat 1B or equivalent. Review of grammar and syntax; use of subjunctive mood in clause construction; reading of selections from classical prose writers. (B) Continued emphasis on grammar and syntax; written compositions.

101A-B. Advanced Grammar and Composition (2-2)

Prerequisite: Lat 3B or equivalent; may be taken concurrently with Latin 131 or 132. Exercises in prose composition; selected works of Cicero and others from the Golden Age of Latin.

131. Classical Latin (3)

Prerequisite: Lat 3B. Survey of Roman literature; readings in prose and poetry of representative authors from Plautus to Apuleius.

132. Medieval and Renaissance Latin (3)

Prerequisite: Lat 131. Recommended: Lat 101B concurrently. Survey of Medieval and Renaissance Latin literature. Readings in *Patrologia Latina*, *Gesta Romanorum*, Erasmus, Luther, Morus; supplementary readings in English on political and cultural backgrounds.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

PORTUGUESE**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. (3 lecture, 2 lab hours)

2A-B. Intermediate Portuguese (3-3)

Prerequisite: Port 1B. (A) Review of grammar; tenses, subjunctive mood and irregular verbs emphasized; prose composition; reading modern novels, plays; sight reading. (B) Composition, conversation, correspondence; lectures on Portuguese civilization; modern prose, drama. Written report on individual reading. Conducted in Portuguese.

RUSSIAN**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. (4 lecture, 1 lab hour)

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; reading of modern stories and novels. Conducted in Russian.

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.

110A-B-C. Survey of 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.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

SPANISH**1A-B. Elementary Spanish (4-4)**

Beginning course of graded lessons acquainting the student with the basic structure and pronunciation of Spanish through practice in speaking, reading, and writing. (4 lecture, 1 lab hour)

2A-B. Intermediate Spanish (3-3)

Prerequisite: Span 1B or two years of high school Spanish. (A) Review of grammar; tenses with emphasis upon subjunctive mood and irregular verbs; prose composition; reading of typical modern novels and plays. Outside and sight reading. (B) Composition; conversation; forms of correspondence; talks on Spanish civilization; modern prose and drama. Written report on private reading. Conducted in Spanish.

3A-B. Intensive Conversation (3-3)

For incoming freshmen with prior instruction in Spanish; admission by departmental placement test. Prepared and impromptu oral reports, class and group discussions; memorization and recitation of poems and short plays. (3 lecture, 1 lab hour)

4A-B. Intensive Reading and Composition (3-3)

For incoming freshmen with prior instruction in Spanish; admission by departmental placement test. Reading prose, poetical and dramatic works; intensive exercises in grammar and syntax; original compositions.

50A-B. Oral Spanish (2-2)

Prerequisite: Span 1B. May be taken concurrently with Span 2A-B. Enrollment limited. Common idioms; correct expression; simple dialogues and plays. (2 lecture, 1 lab hour)

55A-B. Practical Conversation (2-2)

Prerequisite: Span 1B or two or more years of high school Spanish. More advanced than Span 50A-B. Common idioms and correct usage; expression and gestures; practical vocabulary for daily life and travel. (2 lecture, 1 lab hour)

101. Advanced Composition and Conversation (3)

Prerequisite: Span 2B or permission of instructor. Weekly written assignments on varied topics with emphasis on style in composition; class conducted in Spanish.

102. Introduction to Hispanic Culture (3)

Prerequisite: Span 101. Examination of cultural values of the Hispanic world through readings, lectures, films and other media. Weekly written and oral reports by students.

103A-B. Survey of Spanish Literature (3-3)

Prerequisite: Span 2B. An introduction to the principal authors, works, and movements of Spanish literature.

104A-B. Spanish-American Literature (3-3)

Prerequisite: Span 2B. (A) Colonial period: historical; epics of conquest; poetry of outstanding figures such as Sor Juana Inez and others; oral reports and discussion; one written report. (B) Republican period: novel, short story, and essay; special attention to poetry of *modernistas*; the Romantic poets; oral reports and discussion.

105. Spanish-American Fiction of the Twentieth Century (3)

Prerequisite: Span 104B. Intensive study of some of the outstanding Spanish-American novels and short stories of the twentieth century.

106. Spanish Literature of the Golden Age (3)

Prerequisite: Span 103A-B. The main genres of Renaissance Spanish literature with emphasis on at least one representative work for each.

107. Spanish-American Poetry of the Twentieth Century (3)

Prerequisite: Span 104B. Intensive study of the works of some of the most outstanding Spanish-American poets of the twentieth century.

108. Spanish Literature of the Twentieth Century (3) (Former F Lang 118)

Prerequisite: Span 103A-B. Readings in twentieth century Spanish literature as the basis for class discussion of content, form, and theme.

130. Phonetics and Pronunciation (3)

Not open to studies with credit in F Lang 130A (Spanish) or Span 120. Prerequisite: Span 2B or permission of instructor. Intensive drill on phonetics for pronunciation, enunciation, intonation. Designed especially for students working toward an elementary or secondary credential in Spanish.

132. Methods of Teaching Spanish in Elementary Schools (3)

Not open to students with credit in F Lang 130B (Spanish). Not applicable on the Spanish major. Methods, materials, bibliography for Spanish in elementary schools.

135. History of the Spanish Language (3)

Prerequisite: Span 2B. The evolution of Spanish from Vulgar Latin to modern Spanish. Study of phonetic, morphological and syntactical changes; development of lexicon.

137. Applied Linguistics (3) (Former Ling 132)

Prerequisite: Span 101 (or concurrently); Ling 135. Phonological, morphological, syntactical, and lexical structure of Spanish; conflicts with English structure; linguistic problems in design of teaching materials.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Foreign Language*.

GEOGRAPHY DEPARTMENT

Professors: Cole (Chairman), Crosby, Ervin, Montgomery
 Assistant Professors: A. Johnson, R. Lee, Nasse, Norsworthy
 Part-time: R. Erickson, Heard, Read

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. (See *History Department—Asian Studies*).

Five of the California State Colleges, including Fresno State College, 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 45 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. Two years of one foreign language are recommended for majors intending to do graduate work in geography.

GEOGRAPHY MAJOR

	<i>Units</i>
Geog 3, 4, 5, 130	11
Elect from: Geog 103, 108, 109, 110, 111, 112, 115, 116, 120, 177, 181, 190, Ag 31, 136, Biol 157, Engr 103, Geol 105, Math 40, Soc 163	24
Elect from: electives listed above, Geog 124, 125, 126, 127, 128T, 129, 140, 141, 142, 143, 189	10
	45

Additional Requirements: Introductory course in anthropology, economics, or sociology (may be applied on general education); Geol 1 is required if Geol 105 is selected above.

GEOGRAPHY MINOR

Geography 3, 4	6
Elect from: Geog 5, Geog (ud), Biol 157, Geol 105	14
	20

CREDENTIAL PROGRAM

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

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. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

Courses

GEOGRAPHY

Note: Geography courses, except Geog 5 and 108, count as social science (not as physical science) in fulfillment of general education requirements.

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. Meteorology (3)

Weather analysis; factors basic to weather forecasting and climatological studies. (One 2-hour Saturday field trip required)

103. Industrial Regions (3)

Prerequisite: Geog 3, permission of instructor. Study of form and function; internal, interregional and extraregional connections of the world's industrial regions.

108. Climatology (3)

Prerequisite: Geog 5 or equivalent. Climates of the earth and their significance to man.

109. Natural Vegetation Regions of the World (3)

Prerequisite: permission of instructor. Geographic character, distribution, and environmental relationships of natural vegetational features of the main land masses, land forms, and climatic regions of the world.

110. Physiography of the United States (3)

Prerequisite: Geol 1. Natural divisions of the United States based on surface features and their interrelationships.

111. Map Interpretation (2)

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.

112. Aerial Photograph Interpretation (3)

Prerequisite: Geol 1, 1L, permission of instructor. Aerial photographs as a means of determining culture, topography, and vegetation; scale, use of index, vertical and oblique photographs, and stereoscopes.

115. Cartography (3)

Use of instruments for drafting and lettering of maps; construction and use of standard map projections; relief representation and map reproduction; cartographic source materials and literature; field trips.

116. Political Geography (3)

Power factors in international relations; concepts of space, resources, industry, agriculture, technology, population, and food supply; cultural groups related to states and their association.

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)

Regional distribution of resources and industries of the USSR.

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.

127. Europe (3)

Geographic regions of Europe emphasizing the relation of human activities to physical factors areal in their distribution and influence.

128T. Eurasian Regions (3; max total 9, if no area repeated)

Geographic regions of Eurasia emphasizing physical and cultural features. See *Schedule of Courses* for region to be considered in a given semester.

129. Africa (3)

Systematic survey of Africa; cultural and natural features related to economy of individual countries.

130. Geographic Literature (2)

Prerequisite: geography major or minor. Primary and secondary source materials; literary background of geography.

140. Canada and Alaska (2)

Regional study of advantages and limitations of the natural environment upon present and future problems involving resource distribution, human activities, and regional and interregional adjustments.

141. Conterminous United States (3)

Systematic and regional survey of the United States; cultural and physical phenomena related to economy.

142. South America (3)

Relationship of natural and cultural features; economic and social development; man-land relationships. Countries considered individually.

143. Caribbean America (3)

Relationship of natural and cultural features in Mexico, Central American countries, and Caribbean islands and countries; social and economic development; man-land relationships.

177. 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 or summer field tours.

181. Technical Field Geography (3)

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 (2)

Natural and cultural patterns of California; historical and regional geography of the state.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

203. Seminar in Economic Geography (3)

Prerequisite: Math 40, its equivalent, or permission of instructor. Theory, concepts, and methods in economic geography.

205. Seminar in Regional Geography (3)

Prerequisite: 9 units of upper division geography or permission of instructor. Theories of regional geography; method in regional delimitation; applied regional geography.

206. Seminar in Physical Geography (3; max total 6 if no field repeated)

Prerequisite: Geog 108, 110, or Geol 105. Principles, concepts, and theories in the systematic study of physical geography and its methodology. Each offering will be chosen from the fields of landforms, climate, water and soils, or natural vegetation.

215. Advanced Cartography (3)

Prerequisite: Geog 115 or permission of instructor. Advanced techniques in planning, compilation, and execution of maps and diagrams; research using primary and secondary source materials; use of advanced cartographic instruments, map reproduction methods.

230. Contemporary Geographic Thought (3)

Prerequisite: graduate standing or permission of instructor. Current theories of geography and their evolution.

270. Seminar in Selected Regions (3; max total 6 if no region is repeated)

Prerequisite: undergraduate course on 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.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

301. Recent Interpretations in Geography (2; max total 12 if no topic repeated)

GEOLOGY DEPARTMENT

Professors: Beard (Chairman), Stanley
 Associate Professors: Cserna, Mack
 Assistant Professors: Avent, Blackerby
 Part-time: Addington, Leyden

The Geology Department offers majors in geology for the bachelor of arts degree and for the bachelor of science degree. Geology offerings include undergraduate preparation for professional careers and for graduate work. The introductory course in geology meets a natural science requirement in general education; and courses for earth study as an avocation.

Five of the California State Colleges, including Fresno State College, 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 Geology and Biology Departments. See *Special Programs—Moss Landing Laboratories*; for course descriptions see *Biology Department*.

BACHELOR OF ARTS AND BACHELOR OF SCIENCE DEGREES MAJORS IN GEOLOGY

The bachelor of arts degree with a major in geology consists of a total of 124 units including 37 units of geology. The bachelor of science degree with a major in geology consists of a total of 128 units including 46 units of geology. See requirements listed below. 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.

Geology Major for BA Degree

	<i>Units</i>
Geol 1, 1L, 2, 12A-B, 101, 106, 107, 108	27
Elect from upper division geology	10
	37

Additional Requirements: Chem 2A-B or 1A-B; Math 71 and 72 or 75, Physics 2A-B. Recommended: 1 year of French, German, or Russian.

Geology Major for BS Degree

Geol 1, 1L, 2, 12A-B, 101, 106, 107, 108, 110, 112, 113A, 118	38
Elect from upper division geology	8
	46

Additional Requirements: Biol 1B; Chem 1A or 2A-B; Chem 1B; Math 75, 76; Physics 4A-B-C. Recommended: French, German, or Russian.

GEOLOGY MINOR

A minor in geology consists of 17 units of which at least 6 are upper division. It is recommended that Geol 1, 2, 12A-B, 101, and either 105 or 1L and 189 be included in the minor.

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*.

*Courses***GEOLOGY****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 trip required. (2 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.

12A-B. Mineralogy (3-2) (Former Geol 12, 13)

Properties, relationships, origin of minerals; form and structure of crystals; determination of common minerals by physical and chemical tests. (Geol 12A: 2 lecture, 3 lab hours. Geol 12B: 1 lecture, 3 lab hours)

25. Engineering Geology (3)

Not open to freshmen. For engineering students. Principles of physical geology; application of geology to engineering structures and projects.

101. Petrology (3)

Prerequisite: Geol 1, 12A-B (or concurrently). Common rock-forming minerals; origin, classification, textures, and structures of igneous, sedimentary, and metamorphic rocks; examination of rocks in the hand specimen. (2 lecture, 3 lab hours)

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.

106. Structural Geology (3)

Prerequisite: Geol 1, 1L, 2 or permission of instructor. Structural arrangements of rocks; intrusive and extrusive rock structures; folding and faulting; unconformities; applications to geophysical prospecting. May include field trips. (2 lecture, 3 lab hours)

107. Field Geology Methods (3)

Prerequisite: Geol 1, 1L, 2, 106. Field trips to introduce students to methods and instruments used in geologic field work. (6 lab hours, usually on week ends)

108. Field Geology (6)

Prerequisite: Geol 101, 107. Geologic reconnaissance and application of instrumental methods in geologic mapping and written report of area selected for study.

109. General Oceanography (4)

Prerequisite: college chemistry and biology, Geol 1. 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 ML 101. (3 lecture, 3 lab and field hours.)

110. Paleontology (3)

For geology and biology majors. Prerequisite: Geol 2, and either Biol 1B or Zool 1; or permission of instructor. Structures and development of prehistoric animals; invertebrates and index fossils. May include field trips. (2 lecture, 2 lab hours)

111. Physical Stratigraphy (3)

Prerequisite: Geol 2, 101, 106. Recommended: Geol 107. Principles of stratigraphy and of sedimentation as applied to stratigraphy; features, arrangements, fossils, age and distribution of major rock formations of North America. May include field trips.

112. Optical Mineralogy (3)

Prerequisite: Geol 12B 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)

113A-B. Microscopic Petrography (3-2)

Prerequisite: Geol 101, 112. Problems of classification of rocks; thin section study with petrographic microscope of igneous, sedimentary, and metamorphic rocks. (Geol 113A: 2 lecture, 3 lab hours. Geol 113B: 1 lecture, 3 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.

116. Petroleum Geology (3)

Prerequisite: Geol 101, 106. Theories of origin of petroleum, petroleum structures, prospecting, extraction methods; selected petroleum fields. May include field trips.

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)

Prerequisite: Geol 106 or permission of instructor. Interpretation of geologic maps; advanced problems in structural geology; stereographic net; structural interpretation from aerial photographs. (1 lecture, 3 lab hours)

120. Marine Geology (3)

Prerequisite: Geol 1, 1L, 2. Geomorphology of the ocean basins; marine processes affecting coastal areas; economic resources of the oceans.

124. Geochemistry (3)

Prerequisite: Geol 101, one year of college chemistry. Chemical reactions involved in origin and alterations of rocks and minerals of the earth's crust.

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, and marine geology.

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. 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 *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

250T. Topics in Geology (3; max total 12 if no topic repeated)

Prerequisite: Major or minor in geology; permission of instructor. Advanced studies in such areas as hydrology, regional stratigraphy, marine geology, and geochemistry.

HISTORY DEPARTMENT

Professors: Canales (Chairman), Cobb, Nelsen, Wiley

Associate Professors: Bohnstedt, Comegys

Assistant Professors: Bilderback, Brouwer, Chang, Echols, Gade, Goodwin, Kensel, Klassen, Matthew, Merkle, Nalbandian, Senese, E. K. Smith

Lecturer: Alter

Part-time: A. Leavenworth, Lubic, Redekop, Sawyers

A primary function of the History Department is to give students a liberal education in world and American civilization. It aims to bring to them an understanding of modern society by reviewing the achievements of the past. Thus the department aims 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 greater 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, and courses for use in teaching credential programs as well as the nondepartmental social science and Latin American Studies majors.

THE AMERICAN HISTORY REQUIREMENT

The American history requirement for graduation may be fulfilled by taking (a) the Advanced Placement Examination (see *Regulations and Procedures—Advanced Placement*), (b) the no-credit departmental examination, (c) Hist 11 or 12, or (d) one of the following upper division courses: Hist 167, 172, 173, 174, 176, or 181.

ADVANCED PLACEMENT

Students who earn a composite score of "4" or "5" on the advanced placement examination in history administered by the College Entrance Board will be allowed 3 units of credit for History 11 or 12. A score of "2" or "3" may receive similar credit, subject to the approval of the department. A score of "1" will receive neither credit nor advanced placement.

HISTORY MAJOR

The following major requirements are in addition to the general education requirement in social science. No course may be used to meet more than one line of requirements.

	<i>Units</i>
Modern Europe: Hist 141, 142, 146, 147	6
United States: Hist 171, 172, 173, 174	6
Hist 199	3
Select 9 units from one and 12 units from another of the areas of concentration listed below (one of which must be other than Modern Europe or United States)	21
Non-Western: Hist 104, 105, 106, 107, 109T, 111A, 133, 135, 136	
Ancient, Medieval: Hist 111A-B, 119T, 120, 121, 122, 131, 132, 137	
Modern Europe: Hist 131, 132, 137, 138, 143, 144, 149T, 160A-B	
England, British Empire: Hist 151, 152, 155, 158	
Latin America: Hist 160A B, 162A B C, 165, 166, 169T	
United States: Hist 167, 175, 176, 177, 179T, 181, 189A-B	

Additional Requirements: Approved upper division electives in related field (6 un). Lower division courses: Hist. 1, 2, 3, or 7.

Foreign Language Requirement

Two years of satisfactory collegiate study (or equivalent) of one foreign language are required of majors in 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.

	<i>Units</i>
Hist 1, 2, 3, 7, 11, 12 (exclude course if used for general education).....	9-12
Elect from: Non-Western, Latin America, or Ancient-Medieval.....	3-6
Elect from: United States or Canada.....	6-9
Elect from: Modern Europe.....	3-6
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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*.

ASIAN AREA COURSES

Although the college does not offer a bachelor's degree program in Asian studies, there are courses in several disciplines in addition to history which are concerned with this area of the world. 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 following list includes the upper division courses most directly concerned:

- Anthropology 103 Acculturation (3),
- Anthropology 107 Civilizations of Southeast Asia (3),
- Art 119 Art Appreciation and History: Oriental Art (3),
- Art 260 Seminar in Art History (2),
- Economics 114 Economics of Underdeveloped Areas (3),
- Geography 126 Australia, New Zealand, and the Pacific Islands (3),
- Geography 128T Eurasian Regions (3; max total 9),
- Geography 270 Seminar in South Asia (3; max total 6)
- History 7 Far Eastern Civilizations (3),
- History 104 China (3),
- History 105 Japan and Korea (3),
- History 106 India and Pakistan (3),
- History 107 Southeast Asia,
- History 109T Studies in Non-Western History (1-3),
- History 205 Seminar in Far Eastern History (3),
- Political Science 141 Governments of the Commonwealth (3).

Consult the appropriate departmental section of this catalog for course descriptions and prerequisites.

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 College. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, 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.

Courses

HISTORY

1. Western Civilization to 1650 (3)

Meets general education requirement in the area of man and culture. Foundations of western civilization; interdependence of cultures and peoples; cultural development from prehistoric times to 1650. (2 lecture, 1 quiz sections.)

2. Western Civilization Since 1650 (3)

Not open to students with credit in Hist 4A-B. Meets general education requirement in the area of man and culture. 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.

3. Colonial America (3) (Former Hist 8A)

May apply on general education group 7. Western Hemisphere history from discovery to independence.

7. Far Eastern Civilization (3)

Meets the general education requirement in the area of man and culture. The cultures and history of the Far East from the earliest times to the present.

11. American History to 1865 (3)

Not open to students with credit in Hist 10. Meets the American history requirement in general education. The formation of the Union and the development of American society to 1865.

12. American History from 1865 (3)

Not open to students with credit in Hist 10. Meets the American history requirement in general education. The development of American society since 1865.

104. China (3)

Prerequisite: Hist 7. Evolution of Chinese culture and nationality from antiquity to the present.

105. Japan and Korea (3)

Prerequisite: Hist 7. Cultural, political, and economic development of Japan and Korea from antiquity to the present.

106. India and Pakistan (3)

Prerequisite: Hist 7. 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 107. Prerequisite: Hist 7. History and cultures of Southeast Asia from earliest times to the present.

109T. Studies in Non-Western History (1-3; max total 6 if no area repeated)

Prerequisite: permission of instructor. Emphasis on class discussion and closely supervised research and writing. Possible topics include Buddhism, Confucianism, Taoism; conflicts between Eastern and Western thought; mandate system after World War I; Middle East independence movements, Ottoman Period; Palestine Hebrew-Arab relations.

111A-B. Ancient World (3-3)

Prerequisite: Hist 1 or equivalent. The ancient Mediterranean world. (A) The Near East and Greece from the earliest times to Philip of Macedon. (B) Alexander the Great, the Hellenistic world, Rome to the reign of Constantine.

119T. Studies in Ancient and Medieval History (1-3; max total 6 if no area repeated)

Prerequisite: permission of instructor. Emphasis on class discussion and closely supervised research and writing. Possible topics include Greek city-states, decline and fall of the Roman Empire, rise of Christianity, Crusades, Conciliar Movement, feudal institutions, urbanization of Europe.

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)

Not open to students with credit in Hist 121 prior to September 1967. 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.

131. Renaissance (3)

Prerequisite: Hist 2 or equivalent. The foundations of modern Europe during the 14th and 15th centuries.

132. Reformation (3)

Not open to students with credit in Hist 131 prior to September 1967. Prerequisite: Hist 2 or equivalent. Analysis of the political, social, and intellectual movements associated with the 16th century religious upheaval.

133. Armenian History (3)

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)

Prerequisite: Hist 1, 2, or permission of instructor. 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. Russian Civilization to 1800 (3) (Former Hist 137A)

Prerequisite: Hist 1, 2, or permission of instructor. The country and peoples of Russia from the ninth century to 1800.

138. Russian and Soviet Civilization Since 1800 (3) (Former Hist 137B)

Prerequisite: Hist 1, 2, or permission of instructor. Political, cultural, and social progress of the Russian people during the 19th and 20th centuries.

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)

Not open to students with credit in Hist 141 or 145 prior to fall 1966. Prerequisite: Hist 2 or equivalent. European culture, institutions, and politics from the death of Louis XIV to the end of the Napoleonic era.

143. Germany (3)

Prerequisite: Hist 2 or equivalent. Political, social, and cultural development of Germany from the seventeenth century to the present.

144. Modern France (3)

Prerequisite: Hist 2 or equivalent. French culture, institutions, and politics from the Old Regime to the Fifth Republic.

146. Europe 1815-1914 (3)

Not open to students with credit in Hist 145 prior to September 1964. Prerequisite: Hist 2 or equivalent. Political, social, and cultural development of Continental Europe from the Congress of Vienna to the outbreak of the First World War.

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 (1-3; max total 6 if no area repeated)

Prerequisite: permission of instructor. Emphasis on class discussion and closely supervised research and writing. Possible topics include The Enlightenment, Social Movements of the Reformation Era, Bismarck, European Colonialism and Nationalism in Africa, Revolutionary Tradition in Russia, War in the Modern World, Nazi Germany.

151. England to 1603 (3) (Former Hist 151A)

Political, economic, and cultural development of the British Isles; constitutional growth; ancient and medieval times through the Renaissance and Reformation to the end of the Tudor Period.

152. England Since 1603 (3) (Former Hist 151B)

Main currents in the thought, culture, and social progress, with emphasis upon constitutional growth, of the British peoples from 1603 to the present.

155. British Empire Since 1714 (3)

Prerequisite: Hist 1, 2, or equivalent. Older overseas empire and break-up; newer empire after 1783; rise, federation, and imperial relations of self-governing dominions; crown colony system; India under the British; British expansion in Africa and the Pacific.

158. Canada (3)

Prerequisite: Hist 3 or equivalent. 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 (2-2)

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 the present; political, social and economic institutions; outstanding literary works.

162A. Platine Countries (3)

Prerequisite: Hist 3 or equivalent. Disintegration of the Viceroyalty of La Plata and the formation of Argentina, Paraguay, and Uruguay from 1800 to the present.

162B. Caribbean America (3)

Prerequisite: Hist 3 or equivalent. Creation and growth of the nations of the Greater Antilles and the Spanish Main: Venezuela, Colombia, Cuba, Haiti, the Dominican Republic, and Puerto Rico, 1800 to the present.

162C. Western South America (3)

Prerequisite: Hist 3 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.

165. Middle America (3)

Prerequisite: Hist 3 or equivalent. Evolution of the states of Middle America out of the dissolution of the Viceroyalty of New Spain and the First Mexican Empire: Mexico and the six Central American Republics, 1800 to present.

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 Foreign Policy (3)

Principles, ideals, and policies of United States in foreign relations.

169T. Studies in Latin American History (1-3; max total 6 if no area repeated)

Prerequisite: permission of instructor. Emphasis on class discussion and closely supervised research and writing. Possible topics include agrarian reform, social change, economic problems, cultural trends, political philosophies, action in world organizations, Latin America and the Cold War.

171. Early American History, 1607-1783 (3)

Meets the American history requirement in general education. 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)

Not open to students with credit in Hist 173 prior to September 1967. Meets the American history requirement in general education. Political, economic, social, and cultural developments of the early agrarian republic.

173. United States History, 1850-1914 (3)

Meets the American history requirement in general education. The Civil War and Reconstruction; problems of an increasingly urban and industrialized society.

174. United States History Since 1914 (3)

Meets the American history requirement in general education. The United States in world affairs; political, economic, social, and cultural developments and problems from 1914 to the present.

175. Representative Americans (2)

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)

Not open to students with credit in Hist 176 prior to fall 1966. Impact of industrialization and urbanization upon American society; leading ideas and values.

179T. Studies in United States History (1-3; max total 6 if no area repeated)

Prerequisite: permission of instructor. Emphasis on class discussion and closely supervised research and writing. Possible topics include constitutional history, religious history, military history, agricultural history, urban history, business history, and others.

181. Westward Movement (3)

Development of western civilization in United States; movement of people and ideas from east to west, persistence and significance.

185. San Joaquin Valley (2)

San Joaquin Valley from Indian days to present; recent expansion in agriculture and industry.

189A-B. California (2-2)

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.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

199. Advanced Study in History (3)

Not open to students with credit in Hist 200. Prerequisite: upper division standing, major in history or political science; permission of instructor. Introductory course for advanced work; bibliography, research techniques, historical writing; appraisal of historians of contemporary significance.

GRADUATE COURSES

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

202. Seminar in Historiography (3; max total 6 if area not repeated)

Prerequisite: major or minor in one of the social sciences, Hist 199 or permission of instructor. Advanced studies in a field of history—American, Latin American, European; writings and philosophies of great historians; development of historiography.

205. Seminar in Far Eastern History (3; max total 6)

Prerequisite: Hist 199 or permission of instructor. Research in specific areas of Far Eastern history and culture.

240. Seminar in European History (3; max total 6)

Open only to history and social science majors. Prerequisite: Hist 199 or permission of instructor.

263. Seminar in Latin-American Studies (3; max total 6)

Prerequisite: Hist 199 or permission of instructor. Recommended: reading knowledge of Spanish or Portuguese. Research in specific areas of Hispanic American history and culture. Field trips to the University of California and Bancroft Libraries.

270. Seminar in American History (3; max total 6)

Open only to history and social science majors. Prerequisite: Hist 199 or permission of instructor.

278. Seminar in Recent Interpretations of American History (3; max total 6 if topic not repeated)

Prerequisite: teaching credential with social science major; or history major or minor. 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 199 or permission of instructor. Research on special problems in California history.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

300. Topics in History (2; max total 8 if no topic repeated)

LATIN AMERICAN STUDIES

The Latin American Studies major and minor are designed to meet the needs of students interested in an academic interdisciplinary major and also those who wish to broaden their studies in a given discipline with a background in the Latin American area. 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 meet the following foreign language prerequisites: Port 1A-B (6 units); Span 2A-B (6 units), required for emphasis on Spanish America; and Port 2A-B (6 units), required for emphasis on Brazil. Lower division prerequisites for required courses listed below include Hist 3, Anthr 2, and Pol Sc 11, 1A or 1B.

MAJOR

	<i>Units</i>
Anthro 105, Geog 142, 143.....	9
Hist 160A-B, 162A-B-C, 165, 166 or 169T, Pol Sc 146.....	13
Span 104A-B	6
Approved Latin American Studies electives.....	12
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	40

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.

	<i>Units</i>
Geog 142 or 143.....	3
Hist 162A-B-C, 165, 166 or 169T.....	3
Pol Sc 146.....	3
Span 104, 101.....	6
Approved Latin American Studies electives.....	8
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MATHEMATICS DEPARTMENT

Professors: Alkire, Labarre

Associate Professors: Ewy, Kipps (Chairman), Zane

Assistant Professors: Donohue, Robinson, Rosenthal, Schwitters, R. Shaw, Van Zwalenberg

Part-time: Costa, Hoskins, C. Huff, Johansen, Travis

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.

Five of the California State Colleges, including Fresno State College, 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 Mathematics and Biology Departments. See *Special Programs—Moss Landing Marine Laboratories*, for course descriptions see *Biology Department*.

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 13 units of credit for equivalents of Math 75, 76, and 77.

ADVANCED PLACEMENT CREDIT

Students who earn a composite score of "4" or "5" on the advanced placement examination in mathematics administered by the College Entrance Examination Board will be allowed five units of credit for Math 75. A score of "2" or "3" may receive similar credit, subject to the approval of the department. A score of "1" will receive neither credit nor advanced placement.

MAJORS

The Mathematics Department offers majors for the bachelor of arts degree and the bachelor of science degree. The bachelor of arts degree is designed primarily for those preparing for graduate study or teaching in mathematics. The bachelor of science degree is intended to prepare those who plan to enter industrial or other applied areas. Any student planning advanced study is advised to meet the foreign language requirement of the school he plans to attend.

Mathematics Major for BA Degree	<i>Units</i>
Math 75, 76, 77, 151, 152, 161 or 162, 171	25
Elect from: Math 103, 107, 108, 109, 110, 111, 116, 153, 161, 162, 172, 173, 174, 181, 182	12

Mathematics Major for BS Degree

Units

Math 75, 76, 77, 81 or 181, 107 or 109, 151, 152, 171 28
 Elect from: Math 107, 108, 109, 121, 131, 153, 172, 173, 174, 181, 182 12

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MINOR

The minor in mathematics includes 20 units of mathematics courses, of which at least 6 must be upper division. Math 27, 28, 29, 30 may not be applied on the minor.

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 ARTS AND MASTER OF SCIENCE DEGREES

The graduate programs in mathematics for master's degrees are based on the corresponding undergraduate programs at Fresno State College. Math 152, 153, 172, 173, and 181 must be completed if not taken in the undergraduate program. In addition, master of arts degree candidates must include Math 110 or 210. For additional information consult the department chairman; 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.

Foreign Language Requirement

Advancement to candidacy for the master of arts degree with a major in mathematics requires two years of satisfactory collegiate study (or the equivalent) in one foreign language. The foreign language requirement may be met by the passing of a proficiency examination.

Courses**MATHEMATICS****27. Elementary Algebra (3)**

Transition from arithmetic to symbolism and generalization of algebra, fundamental operations, equations, formulas, sets, graphs. (See *Duplication of Courses*.)

28. Plane Geometry (3)

Prerequisite: elementary algebra. Points, lines, angles, triangles, polygons, circles; axioms, theorems, problems; proofs and constructions. (See *Duplication of Courses*.)

29. Intermediate Algebra (3) (Former Math B)

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) (Former Math C)

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. Introduction to Statistical Methods (3)

Not open to students with credit in Math 107, 109. Prerequisite: elementary algebra and geometry. Organization of data, descriptive measures, sampling, statistical inference, testing hypotheses, chi-square, correlation and regression.

51. Introduction to Modern Mathematics (3) (Former Math 130)

Prerequisite: two years high school algebra or Math 29. Logic, set theory, probability, Markov chains, matrices, linear programming, introduction to differential calculus, applications to business, economics, psychology and sociology. (2 lecture, 1 discussion hour)

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 (5) (Former Math 3)

Not open to students with credit in Math 72; two units allowed for students with credit in Math 71. Prerequisite: two years of high school algebra, one year of plane geometry, trigonometry. Analytic geometry, limits and derivatives, applications of differentiation, differentials, elementary transcendental functions, the definite integral.

76. Mathematical Analysis II (5) (Former Math 4)

Prerequisite: Math 72 or 75. Definite integrals, indefinite integrations, vectors, polar coordinates, solid analytic geometry, multiple integrals.

77. Mathematical Analysis III (3) (Former Math 6)

Prerequisite: Math 76. Partial derivatives, line integrals, Green's theorem, Taylor's theorem, L'Hospital's rules, sequences, convergence tests for infinite series, introduction to differential equations.

81. Advanced Engineering Mathematics (3) (Former Math 117)

Prerequisite: Math 77. Vectors and matrices; introduction to ordinary differential equations, Laplace transforms, orthogonal functions, Fourier series; introduction to functions of a complex variable; partial differential equations.

103. History of Mathematics (3)

Prerequisite: Math 72 or 75. Development of mathematics since ancient times; mathematics as a part of the general culture of the periods studied; relationship between mathematics and the physical sciences.

107. Probability and Statistics (3)

Prerequisite: Math 77. Introduction to statistics, mathematical development of probability, measures of central tendency and variability, moments, normal distribution, linear correlation.

108. Advanced Statistics (3)

Prerequisite: Math 107. Theory of sampling; problem of estimation; tests of significance; statistical hypotheses; confidence limits; the t, F, and chi-square distributions; analysis of variance and covariance; application of certain tools and techniques.

109. Probability (3)

Prerequisite: Math 77. Classical and axiomatic viewpoints; joint, marginal, and conditional probabilities; Bayes' theorem; repeated trials; convolutions; limit theorems.

110. Symbolic Logic I (3) (See Phil 110)

111. Symbolic Logic II (3) (See Phil 111)**116. Theory of Numbers (3)**

Prerequisite: Math 72 or 75. Divisibility, greatest common divisor, Euler's function, continued fractions, congruences, quadratic residues, Diophantine equations.

121. Numerical Analysis (3)

Prerequisite: Math 77, 152. Finite difference and Lagrangian interpolation formulas; numerical solution of equations, systems of equations, and differential equations; principles of coding and programming computers.

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.

140. Arithmetic and Algebra of the Rational Number System (3)

Not open to mathematics majors. Meets general education mathematics requirement for elementary credential candidates. Prerequisite: elementary algebra and geometry. Development of the rational number system and its subsystems from the informal point of view; sets, relations and operations, equivalence classes; definitions of number systems, isomorphism; algorithms for operations with numbers; prime numbers and divisibility; ratios; applications.

151. Principles of Algebra (3) (Former Math 102)

Prerequisite: Math 76. Integral domains; ordered fields; rational, real, and complex numbers; polynomials and theory of equations.

152. Linear Algebra (3) (Former Math 114)

Prerequisite: Math 151. Linear transformations, matrices, determinants, linear functionals, bilinear forms, quadratic forms, orthogonal and unitary transformations, selected applications of linear algebra.

153. Modern Algebra (3) (Former Math 115)

Prerequisite: Math 152. Group theory, field theory, elements of Galois theory.

161. Principles of Geometry (3) (Former Math 101)

Prerequisite: Math 72 or 75. Modern concepts of geometry. Postulates of incidence, order and separation, congruence. Parallel postulates of Euclidean and non-Euclidean geometry. Selected topics of modern Euclidean geometry.

162. Projective Geometry (3) (Former Math 106)

Prerequisite: Math 151 or 161. 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.

171. Intermediate Mathematical Analysis (3) (Former Math 7)

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 (3) (Former Math 118A)

Prerequisite: Math 171. The real number system, function theory, continuity, differentiability; partial differentiation.

173. Advanced Calculus (3) (Former Math 118B)

Prerequisite: Math 172. Multiple integrals; line and surface integrals; Fourier series and integrals; infinite series.

174. Introduction to Complex Analysis (3)

Prerequisite: Math 171, or 81 and permission of instructor. Introduction to complex analysis including Cauchy's integral theorem and formula, Taylor's and Laurent's series, contour integration, elementary conformal mappings; applications.

181. Differential Equations (3) (Former Math 119)

Prerequisite or concurrently: Math 77. Definition and classification of differential equations; general, particular, and singular solutions; existence theorems; theory and technique of solving certain differential equations; applications.

182. Partial Differential Equations (3) (Former Math 122)

Prerequisite: Math 171, 181. 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 *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

202. Fundamental Concepts of Mathematics (3)

Prerequisite: Math 151, 171. Fundamental notions regarding number theory, number systems, algebra of number fields; functions.

210. Foundations of Mathematics (3) (Same as Phil 200) (Former Math 200)

Prerequisite: Math 110 or 151. Mathematical logic with applications to the development of the real number system and philosophy of mathematics.

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.

251. Abstract Algebra (3) (Former Math 231)

Prerequisite: Math 153. Semi-groups, groups, groups with operators, rings, fields, lattices.

252. Linear Algebra (3) (Former Math 232)

Prerequisite: Math 153. Vector spaces, linear transformations, sets of linear transformations, Euclidean and unitary spaces, infinite dimensional vector spaces.

263. Point Set Topology (3) (Former Math 211)

Prerequisite: Math 173. 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) (Former Math 215)

Prerequisite or concurrently: Math 173 or 182. 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.

271. Real Variables (3) (Former Math 207)

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) (Former Math 205)

Prerequisite: Math 173, 174. Analytic functions, conformal mapping, analytic continuation, meromorphic functions, contour integration and the residue theorem, Laplace transform.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

291. Seminar (3) (Former Math 241)

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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

302. Topics in Mathematics for Teachers (3; max total 6, if topic not repeated)

MUSIC DEPARTMENT

Professors: R. Rea (Chairman), Berdahl, A. Bryon, V. Delaney, Howland, J. Winter

Associate Professors: Baddin, Bakkegard, Bennett, Dempster

Assistant Professors: A. Huff, Irwin, J. H. Martin, Nicklett

Part-time: Cardell, Griswold, Nielsen, Quercia, Robinson

The Music Department offers the following curricula leading to the bachelor of arts degree with a major or a minor in music, with or without a teaching credential. In addition to curricula designed to prepare the student for a professional career in the performance or teaching of music, courses are offered to satisfy general education requirements and avocational objectives for the non-music major.

The department also offers courses leading to the master of arts degree with music education, composition, history and literature, or performance as major areas of concentration.

Students should consult with the department chairman before registering for the major in music.

SPECIAL MUSIC REQUIREMENTS

1. Music majors are required, with the approval of the department chairman, to declare a major area of performance and to perform a satisfactory senior recital before being approved for graduation. (See Mus 10 for applied music areas)
2. All students declaring a music major will be evaluated at the end of each of their first two semesters in the department before being permitted to continue in the major.
3. All transfer students planning to major in music will be required to take a theory placement test which will be scheduled each semester during the orientation period for new students.
4. Music majors are required to participate in a music laboratory each semester. Voice majors will satisfy this requirement by enrolling in a cappella choir; string majors by enrolling in orchestra; brass, woodwind, and percussion majors by enrolling in band; others by enrolling in one of the instrumental or choral organizations named above. After a student has experienced four semesters in the required music laboratory, two of which must have been at Fresno State College, he may elect from any of the choral or instrumental ensembles offered (Music 1-101).
5. Students enrolled in music laboratories in the fall semester are expected to re-enroll for the spring semester. The nature of the work in music organizations (band, orchestra, chorus, etc.) makes it essential that constant personnel be maintained throughout the year. Participation in public performances of these groups must take precedence over any conflicting outside activities.
6. Music majors are expected to attend all departmental concerts and recitals.
7. All students enrolled in applied music courses must attend the monthly departmental student recitals.
8. Music majors enrolled in intermediate or advanced applied music classes and all students enrolled in advanced applied music courses are expected to appear in student recitals.
9. Music majors should include Physics 55 in the general education program.

BACHELOR OF ARTS DEGREE

Each student desiring a bachelor of arts degree with a major or minor in music must fulfill all the requirements listed under *General Degree Regulations* and *General Education*, and complete one of the curricula listed below.

MUSIC MAJOR

The major in music for the bachelor of arts degree requires the completion of the following basic music requirements, one field of concentration, participation in one of the laboratory organizations each semester (see *Special Music Requirements*), and a satisfactory senior recital.

Basic Music Requirements	<i>Units</i>
Music 4A-B, 14A-B, 111B, 114A-B, 116	23
Music 110 (major instrument or voice, at least 4 units in advanced class).....	8
Senior recital	0
Fields of Concentration (Complete one)	5
<i>Elementary Music Education</i> (5 units)	
Music 129 or 136; 139	
Piano and voice tests or instrumental techniques test	
<i>Secondary Music Education</i> (5 units)	
Music 111A; 136 or 187	
Piano and voice tests or instrumental techniques test	
<i>Performance</i> (5 units)	
Music 111A; elect 2 units from Music 104, 124, 134, 136, 154A-B	

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MUSIC MINOR

The minor in music requires the completion of at least 20 units approved by the department chairman, 6 of which must be upper division. Fields of concentration in choral or instrumental music are offered.

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 ARTS DEGREE

The graduate program for the master of arts degree in music is based upon the equivalent of the undergraduate major in music at Fresno State College. Of the 30 units required for the degree, 18 must be in music. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

Courses**MUSIC****1. Music Laboratory (1-2; max see below) (Same as Mus 101)**

Maximum total credit 12 units, not more than 8 of which can be in any one activity. Prerequisite: audition. Freshmen and sophomores (fewer than 60 units) register for Mus 1; others (more than 60 units) register for Mus 101. May apply on general education requirement in the arts. Group performance of music literature for interpretative and creative experience. (See *Special Music Requirements*, 2 and 3)

A cappella choir, college chorus, male chorus, women's chorus, orchestra, band, dance band, AFROTC band, band workshop, opera workshop, chamber music ensembles, small vocal ensembles (single and double duets, trios, quartets, quintets, sextets, octets), small instrumental ensembles (brass and woodwind choirs, string and mixed ensembles). (2 lecture, 2 lab hours per unit)

4A-B. Fundamentals of Music (3-3)

Fundamentals of musical theory; ear training and sight singing. (5 lecture-lab hours)

9. Music Fundamentals for Elementary Teachers (3)

Recommended for elementary credential students. Basic skills and fundamentals for teaching music in the elementary school; piano keyboard; writing and reading music; singing unison and part songs; playing simple melodic and rhythmic instruments; listening to recorded music.

10. Class Instruction in Applied Music (2; max total 8 each area) (Same as Mus 110)

Prerequisite: audition. Freshmen and sophomores (fewer than 60 units) register for Mus 10; others (more than 60 units) register for 110. Instruction according to level of student performance ability. (See *Special Music Requirements*, 5 and 6) Applied music areas: flute, oboe, clarinet, bassoon, French horn, trumpet, trombone, baritone, tuba, percussion, violin, viola, cello, bass, organ (special fee), piano, voice, harp. (2 lecture, 2 lab hours)

14A-B. Harmony (3-3)

Prerequisite: Mus 4A-B or equivalent. Fundamentals of harmony; diatonic and simple chromatic harmony of the eighteenth and early nineteenth centuries.

19. Introduction to Music (2)

Not open to music majors or students with credit in Mus 4A-B or 9. May apply on general education requirement in the arts. The rudiments of music and notation necessary for the reading and understanding of music by the layman.

76T. Listeners' Guide to Music (2; max total 6 if no area repeated)

Not open to students with credit in Mus 76. May apply on general education requirement in the arts. Directed listening for students untrained in music. Areas include introduction to concert music; music of the 17th and 18th centuries; music of the 19th and 20th centuries.

101. Music Laboratory (1-2) (See Mus 1)**104. Counterpoint (2)**

Prerequisite: Mus 14A-B. Modal polyphony of the late sixteenth century; analysis; composition of single lines, simple counterpoint, all types of imitation; writing of three-voice motets with text.

106. Basic Instrumental Techniques for Teachers (2; max total 8)

Basic techniques for teaching instrumental music in public schools; procedures, methods and materials for conducting beginning instrument classes in woodwinds, brass, percussion, violin-viola-cello-bass. See *Special Music Requirements*, 7. (1 lecture, 2 lab hours)

110. Class Instruction in Applied Music (2; max total 8 each area) (See Mus 10)**111A-B. History of Music (3-3)**

Open only to music majors and minors except by permission of instructor. Mus 111A is not prerequisite to Mus 111B. Chronological survey and analysis of the development of music.

114A-B. Advanced Theory (3-3)

Prerequisite: Mus 14A-B. Analysis and application of traditional and contemporary harmonic practices.

116. Conducting (2)

Candidates for teaching credentials should take this course prior to student teaching. Instrumental and choral conducting; essential personal traits and baton techniques. Individual participation; supplementary reading with observation of successful conductors.

119. Classroom Music for Elementary Teachers (2; max total 4)

Prerequisite: Mus 9 or equivalent. Workshop approach to acquaint the classroom teacher with state text materials; methods of developing a varied program of singing, rhythmic, instrumental, listening, and creative activities within the classroom.

124. Form and Analysis (2)

Prerequisite: Mus 14A-B. Analysis of the principal music forms.

128. Accompanying (1; max total 4)

Prerequisite: advanced standing in piano; permission of instructor. Accompanying under supervision. (2 lab hours)

129. Elementary School Music Activities (2)

Recommended for elementary credentials and students with limited music experience. Prerequisite: Mus 9 or 4A. Singing, rhythmic, instrumental, listening, and creative activities, using state textbooks and supplementary materials. Group observations.

134. Composition (2; max total 8)

Prerequisite: Mus 14A-B, permission of instructor. Original composition in various forms, styles, and techniques.

136. Orchestration (2; max total 4)

Prerequisite: Mus 14A-B. Technical aspects of orchestral instruments, their use in achieving various tone colors; problems in scoring for school instrumental ensembles.

137. Band Arranging (2)

Prerequisite: Mus 136. Technical aspects of band instruments, their use in achieving various tone colors; problems in scoring for school instrumental ensembles.

138. Piano Skills for Teachers in Service (2; max total 4)

Open only to teachers in service. Basic keyboard skills needed by elementary teachers.

139. Elementary Music Education (3)

Prerequisite: Mus 129 (except for secondary credential candidates). Philosophy of elementary school music education; organization of music curriculum materials and activities into lesson plans and projects. Observation and practice of teaching methods.

154A-B. Keyboard Harmony (2-2)

Recommended to students needing additional harmonic drill at the keyboard to increase sensitiveness to music and its structure. Application at the keyboard of all the harmonic materials studied in previous courses.

176T. Topics in Music Appreciation (2; max total 8 if no area repeated)

May apply on general education in the arts. Prerequisite: Mus 76T or ability to read music. Directed listening; analysis of music. Areas of music include symphony, keyboard, choral, opera, chamber, baroque, classical, romantic, impressionistic, and contemporary.

187. Choral Techniques and Literature (2)

Prerequisite: Mus 116. Problems in achieving superior choral tone and diction, rehearsal techniques, style and interpretation, conducting techniques, and organization and management; survey of choral literature suitable for school and church ensembles.

188. Teaching Piano in Public Schools (3)

Modern methods of piano teaching; classes in public schools; individual and class teaching; application of methods in Laboratory School.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

206. Advanced Instrumental Techniques (2; max total 4)

Prerequisite: Mus 106 or equivalent; permission of instructor. Teaching and playing techniques for brass, woodwind, string, and percussion instruments; reed making; acoustical principles and application in teaching; materials and literature.

210. Studies in Performance (1-2; max total 4)

Prerequisite: permission of department chairman. Individual lessons on instrument or in voice; historical, analytical, and practical study of standard literature of all periods in major performance area; preparation for public recitals. (Special fee)

214. Theory Seminar (2; max total 4)

Prerequisite: permission of instructor. With approval of instructor, each student elects a project of analysis, arranging, composing, or study according to his special capabilities and interests.

220. Research Methods and Bibliography (2)

Prerequisite: undergraduate history of music. Basic bibliography, literature, and research techniques necessary for graduate study in music. Required of all graduate students working for the master's degree in music.

221. Seminar in Music History (2; max total 6 if no era repeated)

Seminar in critical and analytical study of selected works by composers of an era: Renaissance and Baroque; Classic and Early Romantic; Romantic and Contemporary.

224. Studies in Musical Analysis (2; max total 4)

Analysis of selected works; form, thematic and motive development, harmonic structure, compositional devices and their significance.

234. Studies in Composition (2; max total 6)

Prerequisite: permission of instructor. Critical examination of student composition; reference to works of acknowledged composers; development of contemporary technique in structural and harmonic methods. One work in a given classical form required with choice of harmonic and rhythmic style.

236. Studies in Orchestration (2)

Prerequisite: permission of instructor. Studies in writing for the modern symphony orchestra; preparation of scores based on models from Ravel, Bartok, Rousset, and Stravinsky; development of the symphony orchestra and classical scores.

239. Seminar in Music Education (2; max total 4)

Advanced problems in music education according to needs of students enrolled; administration, supervision, vocal, and instrumental fields.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

301. Music Workshop-Clinic (1-2; max total 8)**307. Musical Instrument Repair (1; max total 3)**

PHILOSOPHY DEPARTMENT

Professor: Colver, Uphold

Associate Professors: Mathers (Chairman), Pitt

Assistant Professors: Foster, Paul

Part-time: Haheys, Starr

The courses in philosophy seek to exhibit the role and function of philosophical principles and methods implicit in any discussion or field of learning which pursues its aim systematically. A critical appreciation of the utility of philosophy will aid the student to develop criteria by which to analyze and seek solutions of the problems of his age and civilization. The general prerequisite for all philosophy courses is successful completion of Engl 1 or an equivalent course in composition. In special circumstances, students lacking the prerequisite may be admitted by permission of the instructor.

PHILOSOPHY MAJOR	<i>Units</i>
Phil 52, 53	6
Elect from: Phil 102, 130, 142	6
Elect from: Phil 152T, 153T, 155T	6
Elect from: Phil 162T, 165, 183, 192T	6
Elect from: Phil 25, 110, 111	3
Elective in philosophy (ud)	3
	<hr/> 30

Note: Students intending to pursue graduate study in philosophy should seek the adviser's help in planning adequate preparation.

PHILOSOPHY-PSYCHOLOGY MAJOR	
Psych 25, 66, 101, 102, 110, 118	18
Phil 52, 53, 165; Phil 110 or Math 51	12
Elect from: Phil 102, 141, 142	3
Elect from: Phil 152T, 153T, 155T, 162T	3
Elect from: Anthro 2, 103, 104	3
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PHILOSOPHY MINOR	
Elect from: Phil 102, 110, 111, 130, 142	3
Elect from: Phil 152T, 153T, 155T	3
Elect from: Phil 162T, 165, 183, 190, 192T	3
Electives in philosophy	6
	<hr/> 15

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*.

Courses

PHILOSOPHY

20. Introduction to Philosophy (3) (Former Phil 1)

Discussion of problems arising out of human conduct and the pursuit of knowledge.

22. Practical Logic (3)

May apply on general education requirement in philosophy. Structure of the most common informal fallacies in everyday reasoning and of the features of ordinary language which make them plausible. Illustrations from contemporary disputes over political, moral, and religious issues.

23. Inductive Logic (3)

May apply on general education requirement in philosophy. Inductive (i.e. probable) reasoning used for everyday decisions and in the sciences. Criteria for evaluating the credibility of conclusions of such inferences as argument by analogy, induction by enumeration, and explanatory induction; elementary probability determinations.

25. Deductive Logic (3) (Former Phil 5)

Introduction to modern symbolic logic, with illustrative applications to ordinary language and philosophy.

52. History of Greek Philosophy (3) (Former Phil 10A)

The development of scientific and philosophical thought in its general context from Thales to Lucretius.

53. History of European Philosophy (3) (Former Phil 10B)

Medieval and modern philosophy; impact of the scientific revolution on development of philosophical systems from Descartes to Kant.

101. Contemporary Conflicts in Morals (3)

Philosophical basis for current views concerning individual morality, individual rights, use of violence, and other moral issues; readings selected from literary and journalistic, as well as philosophical and political sources.

102. Ethics (3)

Analysis and discussion of concepts in moral discourse; investigation of the nature of moral reasoning and of claims to moral knowledge.

110. Symbolic Logic I (3) (Same as Math 110)

Prerequisite: Math 75 or permission of instructor. Rigorous development of deduction; 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.

111. Symbolic Logic II (3) (Same as Math 111)

Prerequisite: Phil 110 or permission of instructor. Continuation of Phil 110. Logic of relations and identity; reduction to normal forms; formalization of informal proofs; formal definition of theoretical concepts and axiomatization of scientific theories.

130. Aesthetics (3)

Philosophy of criticism: analysis of problems involved in talking about the arts, and of theories of interpretation and evaluation of the arts, such as music, painting, literature.

141. Comparative Religions (3)

Analysis and comparison of answers to basic philosophical questions raised by Hinduism, Buddhism, Taoism, Confucianism, Shinto, Zoroastrianism, Islam, Judaism, and Christianity.

142. Philosophy of Religion (3) (Former Phil 140)

Prerequisite: 3 units of philosophy. Theories of religious knowledge, religious values, the concept of God, and the problem of evil.

152T. Studies in Ancient Philosophy (3; max total 6)

Intensive study of the writings of a philosopher or philosophers: the pre-Socratics, Plato, Aristotle, Hellenistic philosophy, Plotinus.

153T. Studies in Medieval and Modern Philosophy (3; max total 6)

Intensive study of the writings of a philosopher or philosophers: scholastic philosophy, Hobbes, Descartes, Spinoza, Locke, Leibniz, Berkeley, Hume, Kant.

155T. Studies in Twentieth Century Philosophy (3; max total 6)

Intensive study of an influential philosopher or philosophical movement of this century.

162T. Studies in Metaphysics and Epistemology (3; max total 6)

Inquiry into the nature of reality, and an evaluation of methods of knowing it. Alternative topics include existence, personal identity, perception, and memory.

165. Philosophy of Science (3)

Prerequisite: 9 units of science. Problems of meaning and method in contemporary science: criteria for meaningfulness of scientific concepts, logical structure of scientific theories and of their confirmation.

175. Philosophy of History (3)

Prerequisite: 6 units of upper division history or permission of instructor. Assumptions and methods of historical inquiry, nature of historical knowledge, theories of historical explanation, objectivity and the problem of selection, relationship of history to science and literature.

180. Philosophy in the Humanities (3)

Prerequisite: completion of group 3 (Literature, Philosophy and the Arts) and group 5 (Oral and Written English) of the general education requirements. Areas of modern philosophy and logic with emphasis on their pertinence to composition, the humanities, and the development of forensic skills. Recommended for teachers.

183. Living Philosophies in World Literature (3)**190. Independent Study (1-3; max see reference)**

See *Regulations and Procedures—Independent Study*.

192T. Studies in Philosophy of Language (3; max total 6.)

The analysis of language as an instrument in human activities; theory and practice in the analysis of words, assertions, and questions; relation of language analysis to the solution of philosophical problems.

199T. Special Topics (1-3; max total 6)

Topics not intensively treated in any other philosophy course; for example, philosophy of law, oriental philosophy, philosophy and psychoanalysis, dialectical materialism.

GRADUATE COURSE

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

200. Foundations of Mathematics (3) (See Math 210)

RELIGION**20. Religion and the Modern Mind (3) (Same as Rel 120)**

May apply on general education requirements, group 7 (Humanities). A survey of what religion is, what the modern mind is, and a study of how each has made an impact upon the other.

120. Religion and the Modern Mind (3) (See Rel 20)**182. Literature of the Bible: Old Testament (3)**

Not open to students with credit in Engl 182. May apply on general education requirements, group 7 (Humanities). A survey of the Old Testament documents in translation, with special attention to the development of religious ideas.

183. Literature of the Bible: New Testament (3)

Not open to students with credit in Engl 182. May apply on general education requirements, group 7 (Humanities). A survey of New Testament documents in translation, with special attention to the development of religious ideas.

PHYSICAL EDUCATION AND RECREATION DEPARTMENT

MEN

Professors: Coleman (Chairman), H. Beatty (Coordinator—Men), B. Johnson, Pape, Warmerdam
 Associate Professors: M. Anderson, Beiden, Burgess, Gleason, Gregory, Hairabedian, Juliana (Coordinator—Recreation), Wild
 Assistant Professors: Donnelly, Estes, Francis, Van Galder
 Instructor: Schmidt
 Lecturers: B. G. Bennett, Rogers
 Part-time: Colvin, Ferguson, Guzman

WOMEN

Associate Professors: Doyle, Hupprich, Mason (Coordinator—Women)
 Assistant Professors: Kennedy, Thompson, Zufall
 Instructors: Keller, Poston, Schroll
 Part-time: Fitzpatrick, Owensby, Walts

ACTIVITIES

Students are expected to take physical education activities (PE M, C, or W series, former 10, 40, or 50) during the first four semesters. (See *Degrees and Credentials—General Education 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 (PE C11 or C16 and PE M1, PE W28, and PE 152).

Entering men students are given a motor skills test during freshman week, which assists in assignment to an appropriate section of PE M1, which is required of all first-year students. All men students are given a water skills test during freshman week; those failing must take beginning swimming.

MAJORS

Men
 A major in physical education for the bachelor of arts degree consists of 42 units listed below, exclusive of the general education requirement.

	<i>Units</i>
PE 30, 35A-B-C, 45A-B-C-D-E, Rec 60.....	13
PE 106, 108, 125A-B-C-D, 152, 153, 154, 156, 159, H Sc 123.....	29
	—
	42

Additional Requirements: Biol 2A, 66, Phys Sc 12 or equivalent, H Ec 40 or 42.

Women

A major in physical education for the bachelor of arts degree consists of 44 units listed below, exclusive of the general education requirement.

PE 15A-B-C-D, 30, 45 A-B-C-D-E, Rec 60	16
PE 111, 115A-B-C-D, 152, 153, 154, 156, 159, H Sc 123.....	25
Elect from: PE 106, 108, 162, Rec 160	3
	—
	44

Additional Requirements: Biol 2A, 66, Phys Sc 12 or equivalent, H Ec 42.

MINORS

Men

The minor in physical education consists of 21 units of which at least 12 must be upper division and permits, with guidance, a selection of courses to satisfy special interests and needs.

	<i>Units</i>
PE 30, 35A-B-C, 45A-B-C-D	9
PE 106, 152, 153, 159	8
PE electives 125A-B-C-D	4
	—
	21

Women

The minor in physical education consists of 21 units of which at least 12 must be upper division.

PE 15A-B-D, 30, 45A or B, 45D	9
PE 111, 115A or B, 152, 159	8
PE electives: PE 115A-B-D	4
	—
	21

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 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 College. At least 21 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

Courses

Note: Not more than 2 units in any one activity (PE M, C, W—former 10, 40, 50) may be applied toward the general education requirement. Activity courses must be taken in sequence. Upper division credit (PE M, C, W upper division—former 110, 140, 150) will be given for PE M, C, or W activities, with exception of PE M1, 2, and PE W28, taken after general education physical education requirement has been met. Courses are coeducational unless otherwise designated.

M (former 10) Series—Men Only (See Courses—Note.)

- M1. Group Games (1)**
Archery, badminton, handball, tennis.
- M2. Group Games (1)**
- M4. Cross Country (1)**
- M6. American Football (1)**
- M7. Basketball (1)**
- M8. Track and Field (1)**
- M9. Baseball (1)**
- M10. Elementary Swimming (1)**
- M11. Intermediate Swimming (1)**

Prerequisite: M10 or permission of instructor.

M12. Advanced Swimming (1)

Prerequisite: M11 or permission of instructor.

M13. Elementary Boxing (1)**M16. Elementary Wrestling (1)****M18. Advanced Wrestling (1)**

Prerequisite: M16 or permission of instructor.

M19. Elementary Tennis (1)**M20. Intermediate Tennis (1)**

Prerequisite: M19 or permission of instructor.

M21. Advanced Tennis (1)

Prerequisite: M20 or permission of instructor.

M22. Elementary Handball (1)**M23. Intermediate Handball (1)**

Prerequisite: M22 or permission of instructor.

M24. Advanced Handball (1)

Prerequisite: M23 or permission of instructor.

M25. Elementary Golf (1)**M26. Intermediate Golf (1)**

Prerequisite: M25 or permission of instructor.

M27. Advanced Golf (1)

Prerequisite: M26 or permission of instructor.

M28. Elementary Archery (1)**M31. Elementary Gymnastics (1)****M32. Intermediate Gymnastics (1)**

Prerequisite: M31 or permission of instructor.

M34. Elementary Badminton (1)**M35. Intermediate Badminton (1)**

Prerequisite: M34 or permission of instructor.

M37. Elementary Volleyball (1)**M38. Intermediate Volleyball (1)**

Prerequisite: M37 or permission of instructor.

M40. Body Building (1)**M41. Intermediate Body Building**

Prerequisite: M40 or permission of instructor.

M45. Self-Defense (1)**M52. Advanced Water Polo (1)****15 Series—Women Only****15A. Fundamentals of Rhythmic Activities (2)**

Limited to physical education majors and minors. Prerequisite: PE C16. Practice and analysis of body movement in dance; rhythmic, space and quality elements; elementary composition; brief history of dance. (2 2-hour lecture-labs)

15B. Fundamentals of Team Sports (2)

Limited to physical education majors and minors. Prerequisite: PE W46 (major-minor section). Strategy, skill, and rules of softball, soccer, speedball, speedway, volleyball; acceptable performance. (2 2-hour lecture-labs)

15C. Fundamentals of Basketball (1)

Limited to physical education majors and minors. Analysis and practice of skills and team play; interpretation of rules. (2 1-hour lecture-labs)

15D. Fundamentals of Gymnastics and Track and Field Activities (1)

Limited to physical education majors and minors. Analysis and practice of elementary gymnastics and track and field activities; exercises appropriate for conditioning the participant. (2 1-hour lecture-labs)

30. Foundations of Physical Education (2)

Coeducational. Introduction to the physical education program in secondary schools; personal, social, and professional requirements; demands on the physical education teacher.

35 Series—Men Only**35A. Theory and Analysis of Team Sports (1)**

Scheduled first 8 weeks of semester. Limited to physical education and recreation majors and minors. Speedball—Soccer—Volleyball—Softball; analysis and practice of skills.

35B. Theory and Analysis of Combatives (1)

Scheduled second 8 weeks of semester. Limited to physical education majors and minors. Analysis and practice of skills.

35C. Theory and Analysis of Gymnastics (1)

Limited to physical education and recreation majors and minors. Analysis and practice of skills.

C (former 40) Series—Coeducational (See Courses—Note.)**C1. Adaptive Body Mechanics (1)**

Medical referrals.

C5. Senior Lifesaving (1)

(Prerequisite: permission of instructor)

C6. Water Safety Instructor Course (1)

Prerequisite: current lifesaving certificate.

C8. Advanced Tennis (1)

Prerequisite: M20, W7, or permission of instructor.

C9. Elementary Gymnastics (1)**C10. Intermediate Gymnastics (1)**

Prerequisite: C9 or permission of instructor.

C11. Elementary Folk and Square Dancing (1)**C14. Elementary Social Dancing (1)****C16. Elementary Modern Dance (1)****C17. Intermediate Modern Dance (1)**

Prerequisite: C16 or permission of instructor.

C18. Advanced Modern Dance (1)

Prerequisite: C17 or permission of instructor.

C21. Elementary Archery (1)**C22. Intermediate Archery (1)**

Prerequisite: C21, M28, W21, or permission of instructor.

C24. Elementary Bowling (1) (Fee \$1.45 per week)**C25. Intermediate Bowling (1) (Fee \$1.45 per week)**

Prerequisite: C24 or permission of instructor.

C27. Elementary Ice Skating (1) (Fee \$15)**C28. Intermediate Ice Skating (1) (Fee \$15)**

Prerequisite: C27 or permission of instructor.

C31. Elementary Badminton (1)

C32. Intermediate Badminton (1)

Prerequisite: C31, M34, W31, or permission of instructor.

C37. Intermediate Golf (1)

Prerequisite: C25, W36, or permission of instructor.

C40. Elementary Skiing (1)**C52. Intermediate American Folk Dance (1)**

Prerequisite: C11.

C53. Intermediate International Folk Dance (1)

Prerequisite: C11.

C63. Dance Performance (1; max total see below)

Maximum total units 4 in C63 and 163. Prerequisite: C17, PE 162, or permission of instructor.

45 Series—Coeducational**45A. Fundamentals of Aquatics (1)**

Limited to physical education and recreation 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 hours; clinic as needed)

45B. Fundamentals of Tennis (1)

Limited to physical education and recreation majors and minors. Prerequisite: intermediate skill. Study and practice of strokes and tactics; rules; history; skill progression for various levels. (2 hours; clinic as needed)

45C. Fundamentals of Badminton and Golf (1)

Limited to physical education and recreation majors and minors. Study and practice of fundamentals of badminton and golf; organization and conduct of these activities in secondary school physical education program. (2 hours; clinic as needed)

45D. Fundamentals of Folk, Square and Social Dance (1)

Limited to physical education and recreation majors and minors. Prerequisite: C11. Study and practice of elementary leadership in folk, square, and social dance. (2 hours; clinic as needed)

45E. Fundamentals of Social Recreational Activities (2)

Limited to physical education and recreation majors and minors. Selection, evaluation, and organization of social recreational activities; facilities and equipment evaluation; practical projects for leadership in home, school, and community activities. (2 2-hour lecture-labs)

W (former 50) Series—Women Only (See Courses—Note.)**W1. Elementary Swimming (1)**

For nonswimmers.

W2. Low Intermediate Swimming (1)**W3. High Intermediate Swimming (1)**

Prerequisite: W2 or permission of instructor.

W4. Synchronized Swimming (1)

Prerequisite: intermediate swimming skill.

W6. Elementary Tennis (1)**W7. Intermediate Tennis (1)**

Prerequisite: W6 or permission of instructor.

W21. Elementary Archery (1)**W26. Conditioning Exercises and Figure Control (1)****W28. Fundamentals (1)**

W31. Elementary Badminton (1)**W36. Elementary Golf (1)****W37. Intermediate Golf (1)**

Prerequisite: W36 or permission of instructor.

W46. Soccer and Hockey (1)**W48. Volleyball and Basketball (1)****W80. Intercollegiate Volleyball (1; max total 4)****W81. Intercollegiate Basketball (1; max total 4)****W83. Intercollegiate Tennis (1; max total 4)****PE M,C,W Upper Division (Former PE110, 140, 150)**

Activities Courses. (*See Courses—Note.*)

106. Care and Conditioning of Athletes (1)

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.

106L. Care and Conditioning of Athletes Laboratory (1)

Prerequisite: concurrently with PE 106, permission of instructor.

108. Organization of Intramural Sports (2)

Coeducational. For physical education majors. Organization, administration, and motivation of a program of intramural activities in secondary schools.

111. Techniques of Officiating Tennis and Basketball (1) (Former PE 112)

For women only. Prerequisite: previous experience in playing tennis and basketball. Interpretation of rules, officiating techniques, practice in officiating. Examinations and ratings are given by the San Joaquin Board of Women Officials, which collects 75 cents for each practical and 25 cents for each written examination. (2 1-hour lecture-labs)

112 Series—Men Only**112A. Theory and Practice of Officiating Football (1)**

Scheduled first 8 weeks of semester. Prerequisite: varsity squad experience in football or PE 125A; PE 112B concurrent, or permission of department chairman. Analysis and interpretation of rules for football; procedures, mechanics and practice in officiating.

112B. Theory and Practice of Officiating Basketball (1)

Scheduled second 8 weeks of semester. Prerequisite: varsity squad experience in basketball or PE 125B. Analysis and interpretation of rules for basketball; procedures, mechanics, and practice in officiating.

112C. Theory and Practice of Officiating Track and Field (1)

Prerequisite: varsity squad experience in track or PE 125C. Analysis and interpretation of rules for track; procedures, mechanics, and practice in officiating.

112D. Theory and Practice of Officiating Baseball (1)

Prerequisite: varsity squad experience in baseball or PE 125D. Analysis and interpretation of rules for baseball; procedures, mechanics, and practice in officiating.

115 Series—Women Only**115A. Theory and Analysis of Modern Dance (2)**

Prerequisite: PE 15A. The dance as an art; criteria for judging the dance and dancers; contemporary dance scene. Practice in planning and presenting techniques, movement progression, and group studies (2 2-hour lecture-labs)

115B. Theory and Analysis of Team Sports (2)

Prerequisite: PE 15 B-C. Purposes, materials, techniques, rules, interpretations, and organization of team sports for girls in secondary schools; planning and participation in drills and formations. (2 2-hour lecture-labs)

115C. Theory and Analysis of Tennis and Swimming (1)

Prerequisite: PE 45A-B. Preparation of lesson plans for swimming and tennis. Practice teaching followed by class evaluation. Opportunity to observe and assist in the conduct of swimming meets and tennis tournaments. (2 lecture-lab hours)

115D. Theory and Analysis of Gymnastics, Tumbling, and Apparatus (1)

Prerequisite: PE 15D. Analysis and practice of elementary stunts in tumbling, pyramid building, apparatus, trampoline, skill progressions, class organization, and methods of spotting for safety. (2 1-hour lecture-labs)

125 Series—Men Only**125A. Theory and Analysis of Football (2)**

Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

125B. Theory and Analysis of Basketball (2)

Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

125C. Theory and Analysis of Track and Field (2)

Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

125D. Theory and Analysis of Baseball (2)

Limited to physical education majors and minors. Principles underlying participation in competitive interscholastic athletics.

Coeducational Series**152. Elementary School Physical Education (2)**

Prerequisite or concurrently: E Ed 105; one course in rhythmical activities (for men PE C11; for women PE C11, C16, C17 and one course in fundamentals, PE W28). Activities, materials, and methods for teaching physical education in elementary schools based on the California state program. (2 2-hour lecture-labs)

153. Principles of Physical Education (2)

Prerequisite: PE 30. Principles basic to sound philosophy of physical education for the space age; appraisal of historical development; relationship to health education, recreation, and other areas; foundation and functions of physical education in contemporary American society.

154. Organization and Administration of Physical Education in Secondary Schools (3)

Prerequisite: PE 30, 153. Consideration of 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.

156. Kinesiology, Physiology of Exercise, and Adapted Activities (5)

Prerequisite: Physio 1 or Biol 2A, Biol 66, PE 30. Function and mechanics of human motion; aims, techniques, and procedures in prevention and correction of recognized divergencies; planning, evaluation, and selection of adapted activities suitable for the atypical student.

159. Tests and Measurements (3)

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)**

Prerequisite: PE 30, 153, and/or concurrently (men) PE 125A-B-C-D, (women) PE 115A-B-C-D. Principles applied to the teaching-learning process; organization and observation of physical education activities in secondary schools; development of physical education programs.

162. Dance Choreography (1-2; max total 4)

Prerequisite: C16, C17 or equivalent, and permission of instructor. Fundamentals of dance composition.

164. Dance History (2)

Prerequisite: C16. Study of dance through the ages including primitive era, ancient Greek and Roman, Middle Ages, Renaissance preclassic and ballet; theories of modern dance.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

220. Research in Education (2) (See A Ed 220)**230T. Scientific Bases of Physical Education (3; max total 9 if no topic repeated)**

Seminar in a selected topic: research in physical education; body mechanics; analysis of athletic performance.

240T. Programs in Physical Education (3; max total 9 if no topic repeated)

Prerequisite: PE 161. Seminar in a selected topic: facilities and equipment; program development; administration.

250T. Topics in Physical Education (3; max see below)

May be repeated if no topic repeated. Prerequisite: permission of instructor. Seminar in a selected topic; for example, contemporary dance and related art forms.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

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 plan to prepare for positions requiring major responsibility for leadership, supervision, and administration in public, private, industrial, hospital, park, youth, church, camping, outdoor education, and commercial recreation agencies. Recreation is closely allied with fields other than physical education. Additional courses emphasized in the recreation major sequence include practical and theoretical courses in recreation, crafts, music, drama, speech, and science.

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.

RECREATION MAJOR	Units
Rec 60, 160, 171, 172, 173, 174, 174L, 175, 176, 177.....	25
PE 45A, 45E, 152	5
Elect from: (Men) PE 35A, 35C, 125A-B-C-D; (Women) C14, W28, 111.....	2
Biol 101, 102, HSc 48	5
Pol Sc 164B, S Welf 127	6
Psych 111, 119, 120	9
	52

Additional Requirements: In addition to the above courses, the following are required: Art 119, PE C11 and PE M19 or W6. (May apply on general education requirements.)

Special Area Requirements: The required special area program of 20-23 units consists of one of the course groups shown below under art, industrial arts, music, and speech arts and the following additional courses, if not included in the group selected: Art 135; IA 133 (2 un) or 162; Mus 19; and Drama 137, 138.

Art: Art 3, 4, 11, 101, 144 (11 un)

Industrial Arts: IA 80, 133, 162, 164, 179 (11 un)

Music: Mus 1-101, 10-110, 19, 129; 2 units music elective (9 un)

Speech Arts: Drama 33, 34, 133, Spch 20 (12 un)

RECREATION MINOR

The minor in recreation for the bachelor of arts degree consists of 21 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 groups, churches, and clubs.

	Units
PE C11, 45D, 45E.....	4
Rec 60, 171, 175	7
Elect from: Art 11; IA 133, 177.....	2
Elect from: Music 1-101 (college chorus); 76T, 176T	2
Elect from: Drama 33, 34.....	3
Elect from: Art (Art 135 recommended), IA, Mus, PE, Spch Arts.....	3

*Courses***RECREATION****60. Foundations of Recreation (2)**

General orientation to the profession of recreation; lectures, discussion, practical experience and observation; place of recreation in education.

160. Camp Management (2)

Not open to students with credit in PE 155. Prerequisite: Rec 60 or permission of instructor. Theory and practice; basic knowledge of practical skills in camping; administration, organization, and programming in various camp settings; functional projects. Overnight and/or week-end camping trips (approximately \$10 camp trip expenses). (2 2-hour lecture-labs)

171. Community Recreation (2) (Former Rec 161A)

Prerequisite: Rec 60 or permission of instructor. Nature and scope of recreation organization; community organization for recreation; recreation agencies and their services.

172. Recreation Administration (3) (Former Rec 161B)

Prerequisite: Rec 171 or permission of instructor. Administration of recreation; scope and significance of recognized practices; effective approach to special problems in recreation administration. Individual and group field trips.

173. Programs of Recreation (2) (Former Rec 162)

Prerequisite: Rec 171, PE 45E, or permission of instructor. Areas of concentration on leadership principles and procedures; essentials of programming, planning aids, indoor and outdoor activities; mechanics of planning, techniques of presentation, repertoire of recreational activities. (2 2-hour lecture-labs)

174. Principles and Practices of Recreation (2)

Prerequisite: Rec 171. Required of recreation majors; open to others by special permission only. Methods, techniques, practical experience, competency in recreation; prerequisite to field work.

174F. Principles and Practices of Recreation (1)

Prerequisite: Rec 174 (concurrent). A planned work study and/or supervised program of limited field experience as a leader of club, youth, group, center, or playground activity. Application of knowledge to leadership in practice.

175. Field Work in Recreation Leadership (3) (Former Rec 163A)

Prerequisite: Rec 172, 174. Practical experience as leader or assistant recreation leader; supervised leader training in private, public, or special recreation agencies. Weekly conferences, seminar, minimum of four duty hours.

176. Field Work in Recreation Supervision (5) (Former Rec 163B)

Prerequisite: Rec 173, 175. Practical experience as recreation supervisor, assistant, or cadet in organized program; supervised practicum in private, public, special agencies. *Special project required.* Weekly conferences, seminar, minimum of twelve duty hours.

177. Recreation and Park Planning (3) (Former Rec 170)

Prerequisite: Rec 173 or permission of instructor. Functional planning for recreation and park services; application of principles; interpretation and use of standards; relation of programs, personnel, finance, legislation, acquisition, and design in the planning process. Functional project, field trip required.

PHYSICAL SCIENCE

Some of the departments in the School of Arts and 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, Physics 100A-B, Phys Sc 21, 106. Chem 2A-B and Physics 2A-B are strongly recommended.

Courses**PHYSICAL SCIENCE****10. Introduction to Physical Science (3)**

Not open to students with credit in college physics. Prerequisite: one year of high school algebra or equivalent. Elementary astronomy and physics; mechanical, magnetic, and optical principles; application to everyday experiences. Lecture, demonstration.

12. Introduction to Physical Science (3)

Not open to students with credit in college chemistry. Prerequisite: one year of high school algebra or equivalent; Phys Sc 10 is not a prerequisite. Fundamental concepts of chemistry, principles and their applications, contributions of chemical sciences and engineering to everyday living. Lecture, demonstration.

21. Elementary Astronomy (3) (Former Math 21)

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 (2)

Prerequisite: permission of instructor. Development of physical science from the historical standpoint and its significant contributions; philosophy of science, nature of reality, principle of causality, role of definitions in science, uncertainty and measurements, rise and decline of the mechanical view, epistemology.

IN-SERVICE COURSES

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

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)**

PHYSICS DEPARTMENT

Professors: Scott (Chairman), S. Brown, Eliason, Shacklett

Associate Professors: Donaldson, Shockley

Assistant Professor: Dews, Oden, Zender

Part-time: Hilton

The Physics Department is organized and developed to offer scientific programs leading to various degrees in physics, including the bachelor of arts, bachelor of science, master of arts, and master of science. The programs are arranged to assist in meeting the need for qualified teachers and scientifically trained personnel brought about by the increasing applications of physics to industries, communications, aviation, engineering, national defense and particularly to the research which develops these fields.

Five of the California State Colleges, including Fresno State College, 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: algebra (2 years), plane and solid geometry, trigonometry, and chemistry or physics; French, German, or Russian (2 years or more); and mechanical drawing (recommended).

MAJORS

For the bachelor of arts degree a major in physics consists of 36 units of which 24 must be upper division. For the bachelor of science degree, a major in physics consists of 43 units as listed below. For general degree regulations see *Degrees and Credentials*.

Foreign Language Requirement

Two years of satisfactory collegiate study (or equivalent) in French, German, or Russian are required for majors in physics. 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 IN PHYSICS

	<i>Units</i>
Physics Major	36
Phys 4A-B-C, 102, 105A, 107A, 130A-B (25 un)	
Upper division electives in physics (11 un)	
Additional Requirements	26
Math 75, 76, 77, 81, Chem 1A-B	
Foreign Language *	14
Completion of General Education and Electives	48
	124

* Courses taken in high school may reduce this requirement.

BACHELOR OF SCIENCE DEGREE IN PHYSICS

	<i>Units</i>
Physics Major	43
Phys 4A-B-C, 102, 105A-B, 107A-B, 110, 115, 116, 130A-B, 140	
Additional Requirements	38
Math 75, 76, 77, 81, 151, 152, 171, 172, Chem 1A-B	
Foreign Language *	14
Completion of General Education and Electives	33
	128

Recommended courses: Phys 120, Engr 70

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: Math 75, 76, Phys 4A, F Lang (or equivalent)

2nd Year: Phys 4B-C, Math 77, 81, Chem 1A-B, F Lang (or equivalent)

3rd Year: Phys 102, 105A-B, 110, 140, Math 171, 172

4th Year: Phys 107A-B, 115, 116, 130A-B, Math 151, 152

MINORS

A minor in physics for a bachelor's degree requires 18 units of which 6 must be upper division.

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 ARTS DEGREE

The graduate program for the master of arts degree in physics is based on the equivalent of the undergraduate major in physics at Fresno State College. Twenty of the 30 units required for the degree must be 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies. See foreign language requirement below.

MASTER OF SCIENCE DEGREE

The master of science degree in physics is designed for graduates who desire to seek industrial employment in physics and allied fields. Undergraduate preparation equivalent to a physics major at Fresno State College 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies. See foreign language requirement below.

FOREIGN LANGUAGE REQUIREMENT

Advancement to candidacy for the master of arts or the master of science degree with a major in physics requires the passing of an examination demonstrating the ability to read materials of the major in French, German, or Russian.

* Courses taken in high school may reduce this requirement.

Courses**PHYSICS**

Note: Math 77, Physics 4A-B-C are prerequisite to all upper division and graduate physics courses, except Physics 100A-B. No more than 12 units of lower division physics may be applied toward a degree.

2A-B. General Physics (4-4)

Prerequisite: Math 28, 29, or equivalents; satisfactory score on mathematics proficiency test. 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 75. Statics, forces, motions, properties of matter, wave motion and sound; solution of problems illustrating principles of mechanics. (3 lecture, 3 lab hours)

4B. Electricity and Magnetism (4)

Prerequisite: Physics 4A, Math 75, 76. Electrostatics, concepts of fields and potential, capacitance, D.C. circuits, chemical and thermal effects, magnetic fields, induced current, alternating current circuits. (3 lecture, 3 lab hours)

4C. Heat, Light and Radiation (4)

Prerequisite: Physics 4A, Math 75, 76. Temperature, calorimetry, heat flow, engine cycles, lenses, mirrors, optical instruments, spectra, atomic structure, radioactivity, X rays, and nuclear physics. (3 lecture, 3 lab hours)

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: Physics 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) (Former Phys 102A)

Foundations of atomic and nuclear physics, extranuclear structure of the atom, radioactivity and nuclear physics.

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. Advanced Electricity and Magnetism (3-3)

Prerequisite: Physics 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.

110. Physical Optics (3)

Theory of optical phenomena; wave theory of light with applications to optical instruments; interference and diffraction phenomena, dispersion, polarization.

115. Introduction to Quantum Mechanics (3)

Prerequisite: Physics 102, 105A, 110, Math 81. Historical background, postulates, meaning and methods of quantum mechanics; applications to atomic phenomena.

116. Quantum Physics of Atoms (3)

Prerequisite: Phys 115. Quantum mechanics applications to atomic and nuclear physics.

120. Electrical Measurements (3)

Prerequisite: Physics 4A-B-C, Math 77. Theory, operation and use of direct and alternating current measuring instruments. (2 lecture, 3 lab hours)

130A-B. Advanced Laboratory (2-2)

Prerequisite: Physics 102, 105A-B; 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 thermodynamics and kinetic theory with applications.

162. Introduction to Solid State Physics (3)

Prerequisite: Physics 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. Introduction to Mathematical Physics (2-2)

Application of mathematical methods to the solution of problems in physics.

175T. Topics in Contemporary Physics (3)

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.

180A-B. Seminar in Physics (1-1)

Prerequisite: senior or graduate physics major or permission of department chairman.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

Note: Preparation equivalent to a physics major at Fresno State College and the permission of the instructor are prerequisite to admission to any of the graduate courses in Physics.

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)**223. Statistical Mechanics (3)**

Theoretical principles of classical and quantum statistics.

280A-B. Group Study of Selected Topics (3-3)**290. Independent Study (1-3; max see reference)**

See *Regulations and Procedures—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.

POLITICAL SCIENCE DEPARTMENT

Professors: Buckman (Chairman), Svenson
 Associate Professor: Provost
 Assistant Professors: Beach, Kolstad, Moore, Plafkin
 Part-time: A. Leavenworth, Sarkisian

The Political Science Department offers courses leading to a bachelor of arts degree with a major or minor in political science or 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 non-major to meet the general education requirements and provide insight into the field of politics for the general student concerned with his role as a citizen in a democracy.

The department cooperates with other departments in providing a concentration in Asian Studies. (See *History Department—Asian Studies*).

FOREIGN LANGUAGE REQUIREMENT

Majors in political science are required to complete satisfactorily four semesters of college work (or its equivalent) in a modern foreign language. Departmental waivers of this requirement may be granted only in exceptional circumstances.

UNITED STATES CONSTITUTION REQUIREMENT

The United States Constitution (including California state constitution and local government) requirement for graduation should be fulfilled by Pol Sc 11 or Pol Sc 1A-B or 101.

MAJORS

The following major requirements are in addition to the general education requirement in social science.

Political Science	<i>Units</i>
Pol Sc 1A-B, 112A or B, 127, 156.....	15
Elect from: Pol Sc 126, 128, 132.....	3
Elect from: Pol Sc 135, 136, 141, 144, 146.....	6
Elect from: Pol Sc 114, 152, 153, 155, 157.....	3
Elect from: Pol Sc 161, 163, 164A.....	3
Elect from: Econ 178, 180; Hist 137, 138, 151, 152, 167, 176, 177; Soc 111.....	6
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Public Administration	
Pol Sc 1A-B, 164A-B.....	12
Elect from: Pol Sc 152, 156.....	3
Elect from: Pol Sc 161, 163, 167, 169, 174T.....	3
Elect from: Pol Sc 114, 157.....	3
Elect from: Pol Sc 135, 141, 144, 146.....	3
Elect from: Soc 145, 155, 157, 163; Crim 132.....	6
Elect from: Econ 110, 131, 170, 174, 180.....	6
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MINORS

The following minor requirements are in addition to the general education requirement in social science.

Political Science	<i>Units</i>
Pol Sc 1A-B; 112A or B, 156	9
Elect from: Pol Sc 127, 128, 132	3
Elect from: Pol Sc 135, 136, 141, 144, 146	3
Elect from: Pol Sc 161, 163, 164A-B	3
Elect from: Econ 178, 180; Hist 137, 138, 151, 152, 167, 176, 177; Soc 111	3
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Public Administration	
Pol Sc 1A-B, 164A-B	12
Elect from: Pol Sc 152, 156	3
Elect from: Pol Sc 161, 163, 167, 169, 174T	3
Elect from: Soc 157, 163, Crim 132	3
Elect from: Econ 110, 131, 180	3
	<hr/> 24

CERTIFICATE IN PUBLIC ADMINISTRATION

The certificate in public administration is offered to persons interested in training for work in public service. Applications for admission to the program must be approved by the Political Science Department. The certificate in public administration is granted upon completion of an approved program of 23 units with a grade-point average of 2.5 (on a four grade-point system). For information on course requirements, consult the department adviser.

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 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, 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.

*Courses***POLITICAL SCIENCE****1A-B. Comparative Government (3-3)**

Full-year sequence meets the United States Constitution and California state and local government requirement for general education. Essentials and comparative features of major governments of the world. (A) Government and politics of Great Britain, France, and Russia. (B) Politics and government of Switzerland, and the United States; federal, California state and local government relationships.

11. American Government and Institutions (3)

Meets the United States Constitution requirement for general education; federal, California state and local government. Not open to freshmen or to students with credit in Pol Sc 1A-B or 101. Government within the context of society; relevant studies in economics, sociology, anthropology, history, psychology organized around a set of governmental questions.

101. American Constitution, Institutions and Ideals (3)

Meets the United States Constitution requirement for general education. Not open to students below second semester sophomore or with credit in Pol Sc 1A-B, 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 Pol Sc 1A-B, 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.

112A-B. History of Political Thought (3-3)

Pol Sc 112A is not prerequisite to 112B. Prerequisite: Pol Sc 1A-B or permission of instructor. (A) Development of political thought from Plato to Machiavelli with readings and discussions. (B) Development of political thought from Machiavelli to the present.

114. American Political Thought (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Development of American political philosophy from its European foundation to the present; geographic, economic, social and cultural influences on American political ideas; effect on governmental policies and political institutions.

124. Foundations of National Power (2)

Not open to majors or minors in political science. Prerequisite: upper division standing. Major factors underlying international tensions—nationalism, imperialism, and communism; attempts to alleviate these tensions; balance of power concepts; the superpowers United States and the USSR.

126. International Organizations (3)

Prerequisite: Pol Sc 127 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.

127. International Relations (3)

Prerequisite: Pol Sc 1A-B 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.

128. Contemporary World Politics, 1914 to the Present (3)

Prerequisite: Pol Sc 1A-B 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 organization.

129. Contemporary International Problems (2; max total 4)

Prerequisite: Pol Sc 1A-B, upper division standing, permission of instructor. Reading, research, and discussion of current international problems.

132. The Conduct of American Foreign Affairs (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Formulation and execution of foreign policy; constitutional framework; role of the President and the executive branch, Congress, pressure groups and public opinion; contemporary problems and policies.

135. Soviet Institutions (3)

Prerequisite: Pol Sc 1A-B, Hist 137, 138, or permission of instructor. The Soviet State since 1918; political aspects of Soviet institutions.

136. Soviet Foreign Policy (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Sources of Soviet foreign policy, historical and ideological; purposes and formulation of policies; *cold war* policies and practices, attitudes toward East-West tensions, colonialism, underdeveloped areas, neutralism, disarmament; contest for power with red China; current trends.

141. Governments of the Commonwealth (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Commonwealth system and the nations composing it; Australia, New Zealand, Canada, and India; role of emerging nations within the system.

144. The Government of England (3)

Prerequisite: Pol Sc 1A or permission of instructor. Constitutional history since 1900, contemporary political parties, and governmental machinery of the United Kingdom.

146. Latin-American Governments (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Political evolution of the foremost Latin-American republics; racial, cultural, economic, and geographic factors; constitutional history and development of political institutions and parties.

152. Political Parties and Pressure Groups (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. History and characteristics of political parties and pressure groups; their interaction and influence upon nominations, and elections, upon executive and legislative branches of federal, state, and local government.

153. Dynamics of Political Behavior (3)

Prerequisite: Pol Sc 1A-B, permission of instructor. The analysis of political behavior.

155. The American Presidency (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Origin and concepts of the office; sources of power; role of the President in foreign and domestic affairs; future of the Presidency.

156. American Governmental Process (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Contemporary problems and issues of American government.

157. United States Constitution: Growth and Development in Theory and Practice (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Law of the Constitution and its underlying political theory, with leading cases.

161. State and County Government (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. The organization, structure, powers, and functions of state and county governments.

163. Municipal Government and Administration (3)

Prerequisite: Pol Sc 1A-B 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.

164A-B. Public Administration (3-3)

Prerequisite: Pol Sc 1A-B or permission of instructor. (A) Policy and administration; administrative and adjudicative responsibility; planning; budgeting; public relations. (B) Administrative organization; management; personnel administration; foreign administrative systems.

165. Public Personnel Administration (2)

Prerequisite: Pol Sc 1A-B, 164A-B; or permission of instructor. American personnel administration; job recruitment and classification; merit test construction and analysis; salary plans and grades; building employee morale and efficiency, on-job training programs; promotions, demotions, dismissals, retirement programs.

167. Comparative Administration (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Crosscultural and functional comparisons of administrative institutions including personnel and budget systems; influence of political, economic, and social pressures on administration policy formation and the administrative process.

169. Finance Administration and Fiscal Management (3)

Prerequisite: Pol Sc 1A-B or permission of instructor. Financial aspects of government including fiscal organizations and intergovernmental financial relationships. Financial management of governmental units, alternative revenue sources; tax enforcement, budgeting, debt management.

170. Introduction to Planning (2)

Prerequisite: Pol Sc 1A-B or permission of instructor. Planning process in government and role of the planner in a democratic society; planning as a line of function in city, county, and area government; planning boards and commissions.

172. Urban Renewal and Metropolitan Problems (2; max total 4)

Limited to students who can arrange field trips. Prerequisite: Pol Sc 1A-B, or 101, or permission of instructor. Administration of urban renewal programs in cities and counties; concept of the workable program and other requirements for federal aid; problems of intergovernmental cooperation in local and metropolitan areas, housing, planning, and redevelopment programs.

174T. Topics in Public Administration (3; max total 6 if no topic repeated)

Prerequisite: Pol Sc 1A-B or permission of instructor. Intergovernmental relationships, organization and management problems in public agencies and techniques employed to solve them; problems commonly encountered in finance, personnel, and planning administration, decision making.

180. Internship in Public Administration (2-6; max total 6)

Prerequisite: Pol Sc 1A-B and permission of instructor. Supervised work and project experience with government agencies; government problems and procedures. (1 weekly seminar; minimum of 3 field hours per unit)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

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

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

212. Seminar in Political Theory (3; max total 6 if topics not repeated)

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: Pol Sc 127, permission of instructor. Research and analysis in an area of international politics: theory, law, organization, conflict resolution, foreign policy formulation.

240. Seminar in American Government (3; max total 6)

Prerequisite: Pol Sc 1B, 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.

249. Seminar in Comparative Government (3; max total 6)

Prerequisite: Pol Sc 1A-B, 127, and permission of instructor. Advanced level synthesis of basic concepts, issues, and problems of comparative government.

264. Seminar in Public Administration (3; max total 6 if topic not repeated)

Prerequisite: permission of instructor. Problems in administrative analysis and organization, tools and techniques of administrative research, interpretation and application of research findings.

269. Seminar in Public Law (3; max total 6 if topic not repeated)

Prerequisite: Pol Sc 114, 157, 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.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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.

PSYCHOLOGY DEPARTMENT

Professors: Lindquist (Chairman), Leavitt, Powell

Associate Professors: Abou-Ghorra, Burton, Button, Cooper, W. Holder, H. E. Madden

Assistant Professors: Breen, Coe, Grossman, Jennings, Kirtley, Pieper, J. M. Smith, Willemsen

Part-time: Allen, Berg, Graves, E. Holder, J. J. Smith, D. Wolff, S. Wolff, Ziefert

The Psychology Department offers work leading to the bachelor of arts and the master of arts degrees. One undergraduate core of courses serves all psychology majors. 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

	<i>Units</i>
Psych 25, 66, 101, 102, 110, 118.....	18
Psychology electives	18
(Recommended electives in preparation for graduate work: Psych 104, 163, and at least three courses from Psych 108, 117, 131, 135, 137, 145, 150, 151, 152)	
	—
	36

Additional Requirements: 12 units from at least three fields—anthropology, biological science, literature, foreign language, mathematics, philosophy; courses must be upper division except in foreign language and must be in addition to general education requirements. At least two years of French, German, or Russian are recommended in preparation for graduate work.

PHILOSOPHY-PSYCHOLOGY MAJOR

	<i>Units</i>
Psych 25, 66, 101, 102, 110, 118.....	18
Phil 52, 53, 165; Phil 110 or Math 51.....	12
Elect from: Phil 102, 141, 142.....	3
Elect from: Phil 152T, 153T, 155, 162T.....	3
Elect from: Anthro 2, 103, 104.....	3
	—
	39

PSYCHOLOGY MINORS

General Psychology Minor

Psych 25, 66, 101; 102 or 118.....	12
Psychology electives	9
	—
	21

Recommended: Math 51.

Psychology Minor for Speech Correction-Audiology

Psych 66, 111, 145.....	9
Elect from: Psych 25, 119, 120, 135, 152, 161, 168, 175.....	12
	—
	21

CREDENTIAL PROGRAM

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

**STANDARD DESIGNATED SERVICES CREDENTIAL WITH SPECIALIZATION
IN PUPIL PERSONNEL SERVICES**

(See *Advanced Studies 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 College. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

Courses**PSYCHOLOGY**

Note: Psych 7 or 10 is prerequisite to all upper division psychology courses.

7. Introduction to Psychology (3)

Meets the psychology requirement for general education. Open only to freshmen. Individual approach to problems of adjustment; scientific principles of psychology in perception, learning, motivation, emotions, intelligence, aptitudes, and personality.

10. General Psychology (3)

Meets the psychology requirement for general education. Not open to freshmen or to students with credit in Psych 7. Fundamental principles of the study of behavior and experience.

16. Personal and Social Adjustment (3)

Not open to freshmen. Recommended: Psych 7 or 10. Personality factors as they relate to problems of adjustment.

25. Elementary Statistics (3)

Prerequisite: two years high school algebra or Math 29. Descriptive statistics and elementary hypothesis testing in the behavioral sciences. (2 lecture, 2 lab hours)

66. Differential Psychology (3)

Basic considerations in the problems of individual and group data, heredity and environment, genetics and maturation.

101. Behavioral Research I (3)

Prerequisite: Psych 25, 66. Experimental methodology course to introduce techniques of the scientific method; research pursuits in psychophysics, and in physiological, learning, and comparative psychology. (2 lecture, 3 lab hours)

102. Behavioral Research II (3)

Prerequisite: Psych 101. Techniques used in studies and experiments in social, personality, developmental, and clinical psychologies. (2 lecture, 3 lab hours)

103. Personality (3)

Basic theoretical concepts.

104. Intermediate Statistics in Psychology (3)

Prerequisite: Psych 25 or equivalent. Advanced procedures in analysis and interpretation of psychological data. (2 lecture, 2 lab hours)

108. Foundations of Behavioral Science (3)

Prerequisite: Psych 66 or permission of instructor. Critical evaluation of the bases of psychological theories and their relationship to areas of the philosophy of science.

110. History and Systems (3)

Prerequisite: Psych 66 or permission of instructor. Philosophical and historical background of psychology through the first quarter of the twentieth century; establishment of earlier schools and systems of psychology.

111. Mental Hygiene (3)

Basic processes in adjustment; mental health and social problems; application of principles of emotional health.

116. Analytical Psychologies (3)

Prerequisite: permission of instructor. The contributions of Freud, Adler, Jung and other depth-psychologists.

117. Personality in Nature and Culture (3)

Hereditary, physiological, geographical, social and cultural factors in the development of personality; theories of personality.

118. Developmental Psychology (3)

Open only to psychology majors and minors; not open to students with credit in Psych 119, 120, or 123. The psychology of development; infancy, childhood, adolescence, maturity, and old age.

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.

131. Motivation (3)

Prerequisite: Psych 66 or permission of instructor. Factors responsible for instigation and modification of behavior. (2 lecture, 3 lab hours)

133. Contemporary Psychological Theories (3)

Prerequisite: Psych 110; 18 units of psychology or permission of instructor. Analysis and development of current theoretical emphasis in psychology; contemporary psychological literature.

135. Learning (3)

Prerequisite: Psych 101 or permission of instructor. Principles of Learning. (2 lecture, 3 lab hours)

137. Sensation and Perception (3)

Prerequisite: Psych 101 or permission of instructor. The interpretation of sensory data. (2 lecture, 3 lab hours)

139. Thinking and Language (3)

Prerequisite: Psych 101 or permission of instructor. Communication and other symbolic processes. (2 lecture, 3 lab hours)

141. Psychology of Religion (3)

The psychological foundations of religious experience.

145. Social Psychology (3)

The interaction of individuals in groups.

146. Methods in Social Psychology (3)

Prerequisite: Psych 25 or equivalent; Psych 145 (or concurrently). Basic methods in survey research; group dynamics; communication studies; attitude scaling.

147. Psychology of Small Groups (3)

Basic principles of social interaction in small group situations; problems of group leadership and communication; development of attitudes and skills for effective group participation.

150. Comparative Psychology (3)

Prerequisite: Psych 101 or permission of instructor. Comparative functions and behavior of animals. (2 lecture, 3 lab hours)

151. Physiological Psychology (3)

Prerequisite: Psych 101 or permission of instructor. Relationship between physiological processes and behavior. (2 lecture, 3 lab hours)

152. Abnormal Psychology (3)

Theoretical examination of origins, symptoms and treatments of personality disturbances.

152F. Clinical Psychopathology (3)

Prerequisite: permission of instructor. Case material with clinical analyses from psychiatric viewpoint. (2 lecture, 2 clinical lab hours)

153. Psychology of the Criminal (3) (See, Crim 153)**161. Clinical Psychology (3)**

Training, research, theoretical issues, and ethics in clinical psychology and clinical techniques.

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 AEd 115. The atypical child; etiology, symptomology, nosology, recognition and recommendations.

174. Principles and Techniques in Guidance (3) (See A Ed 174)**175. Family Counseling (3)**

Prerequisite: permission of instructor. Psychodynamic treatment of family problems; methods of counseling; psychotherapy.

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 *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

200. Seminar in Psychology (3; max see below)

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: Psych 102, 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)

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)

207. Seminar in Learning and Related Areas (3)

Prerequisite: undergraduate core in psychology or equivalent. Advanced current developments in learning, sensation and perception, physiological and comparative psychology.

208. Seminar in Personality and Related Areas (3)

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. Advanced Psychological Theory (3)

Prerequisite: Psych 133, permission of instructor. Current psychological literature; theoretical significance.

218. Mental Hygiene and Guidance of Children (3) (See A Ed 218)**224. Counseling Techniques (3) (Same as A Ed 224)**

Prerequisite: Psych 174 or permission of instructor. Interviewing; directive and nondirective counseling techniques.

224F. Field Work in Counseling (2-12) (Same as A Ed 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 262 and permission of instructor. Practice in interviewing; use of available field resources such as schools, clinics, hospitals.

264. Diagnosis of Exceptional Children (3; max total 6, 3 on master's degree)

Prerequisite: Psych 265, permission of instructor. Advanced administration and interpretation of individual and group techniques. Field work under supervision.

265. Individual Mental Testing (3) (Same as A Ed 255)

Prerequisite: Psych 163, permission of instructor. Administration, interpretation, and use of current individual intelligence tests. Field work.

266A. Projective Techniques (3)

Prerequisite: Psych 152, 161, 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 265, 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.

271. Group Techniques (3)

Prerequisite: Psych 262, permission of instructor. Application of group process techniques to counseling, therapy, schools, and industrial settings.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

302. Selected topics in psychology (1-3; max total 9 if no topic repeated)

SOCIAL SCIENCE

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 one of the following departments: Anthropology-Sociology, Economics, Geography, History, Political Science.

SOCIAL SCIENCE MAJOR

The following requirements are in addition to the general education requirements in social science.

	<i>Units</i>
Econ 1A	3
Geog 3 or 4	3
Hist 1, 2	6
Soc 1A or Anthro 2	3
From ud Anthro-Soc, Econ, *Geog, Hist, Pol Sc:	
Approved electives in one department.....	15
Approved electives in other departments.....	9
	39

* May not include Geog 5, 6, 108, 111, 112, 115, 130, 180, 181.

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*.

SPEECH ARTS DEPARTMENT

Professors: Campbell, Highlander, Lombard, Taylor, J. Wright

Associate Professors: P. Walker (Chairman), J. Bryon, Burris, Henderson, Loring, McGuire, D. Wilson

Assistant Professors: Adams, Alden, Fong, Fulkerson, G. Graham, Loganbill, Natharius, Newton, Pace, Randall, Stephens, Walton

Instructors: Diestel, B. Graham, Paoletti, Salgado, T. Walker

Part-time: Mullen, A. Vermel, S. Murphy

The Speech Arts Department offers majors for those who seek professional qualification in one or more of the specialized fields of speech: dramatic art, radio-television broadcasting, public address-communication, and speech correction-audiology. 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 public school credentials. The master of arts degree is available under the general provisions listed in this section.

SPEECH TEST

(See *Entrance Examinations*)

MAJORS AND MINORS

The Speech Arts Department offers bachelor of arts degree majors and minors in dramatic art, radio-television broadcasting, and speech (public address-communication) with three options.

The *dramatic art* major provides training for play directors and playwrights, for community recreational leadership, and for personal development, and is a testing ground for professional theatre ambitions.

The *radio-television* major provides for an understanding and critical appraisal of the media as forces of social, educational, and economic significance. It provides preparation for careers in commercial and educational broadcasting and for teaching. It combines theory with broadcast experience opportunities.

The *speech* major is offered with three options. Option I is designed to provide competencies in public address, communication, and oratory for students preparing for careers in public service, working with relatively mature groups of people. Option II is designed to provide competencies in public address and communication for students who desire careers in public service, working with younger groups of people. Option III is designed to provide a broad and basic understanding of speech pathology and audiology. 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.

MAJORS

	<i>Units</i>
Dramatic Art	
Spch 10-110, 20	5
Drama 15-115, 33, 34-134, 133 or 140, 139, 180, 185A or B	20
Approved electives	11
	—
	36
Radio-Television Broadcasting	
Spch 10-110, 20	5
R-TV 15-115, 40, 41, 44, 141A, 144, 145, 147	20
Approved electives	15
	—
	40

	<i>Units</i>
Speech (Public Address and Communication) Option I	
Spch 10-110, 15-115, 20, PAC 24 or 26, 25, 121, 125, 126, 170, 171.....	28
Approved electives	8
	—
	36
Speech (Public Address and Communication) Option II	
Spch 10-110, 20, 134, PAC 24 or 26, 121, 126.....	17
Drama 137, Sp Corr 151, 157.....	8
Approved electives	11
	—
	36
Speech (Speech Correction and Audiology) Option III	
Spch 10-110, 20, PAC 121 or 126.....	8
Sp Corr 150, 151, 152, 156, 157, 162.....	18
Drama 137.....	2
Psych 168.....	3
Approved electives	5
	—
	36
Recommended courses: Psych 119, 145, Soc 1A, 165.	

MINORS

	<i>Units</i>
Dramatic Art	
Spch 10-110, 20.....	4
Drama 15-115, 33, 34-134, 133.....	11
Approved electives	5
	—
	20
Radio-Television Broadcasting	
R-TV 15-115, 40, 41 or 44, 147.....	12
Approved electives	12
	—
	24
Speech (Public Address and Communication) Option I	
Spch 15-115, PAC 25, 121, 125 or 126, 170, 171.....	16
Approved electives	4
	—
	20
Speech (Public Address and Communication) Option II	
Spch 20, PAC 121, 126.....	9
Drama 137, Sp Corr 151, 157.....	8
Approved electives	3
	—
	20
Speech (Speech Correction and Audiology) Option III	
Spch 20.....	3
Sp Corr 150, 151, 152, 157, 162.....	15
Approved electives	2
	—
	20
Recommended courses: Psych 119, Soc 1A.	

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*.

**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 meets the requirements for certification by the American Speech and Hearing Association and is the basis for the undergraduate preparation for the master of arts degree in speech pathology-audiology. For additional information see credential adviser.

	<i>Units</i>
A Ed 160, Psych 168.....	6
Sp Corr 150, 151, 152, 153, 154, 156, 157, 162, 163, 164.....	30
Approved elective	3
	—
	39
Professional Requirements: Sp Corr 255 (4 un), A Ed 164 (4 un), approved elective (2 un).....	10
	—
	49

(Recommended: Psychology minor for speech correction and audiology)

MASTER OF ARTS DEGREE

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 College. 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*. 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.

Courses

DRAMATIC ART

15. Dramatic Arts Laboratory (1-2; max total 4)

Prerequisite: permission of instructor. Group laboratory experience in presentation of major productions for public performance. (4-8 hours arranged)

33. Techniques of Acting (3)

Prerequisite: Spch 20 or permission of instructor. Fundamental techniques and theories of acting. (3 2-hour activity and 4 arranged hours)

34. Theatre Craft (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. Theatre Arts (2)

Study of the theatre arts; major styles of dramatic composition and production; analysis of representative examples.

115. Advanced 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)

131. Playwriting (2; max total 6)

Prerequisite: permission of instructor. Play analysis, exploration of folk material, fundamentals of playwriting, critical analysis and revision of manuscripts, experimental production of completed scripts. (2 lecture-lab and arranged hours)

133. Advanced Acting (3) (Former Spch 139A)

Prerequisite: Drama 33 or permission of instructor. Advanced techniques of acting. (2 2-hour activity and 4 hours arranged)

134. Advanced Theatre Craft (3) (Former Spch 182) (Same as IA 134)

Prerequisite: Drama 34 or permission of instructor. Advanced training in the crafts of technical theatre; preparing plays for major public performance. (3 lecture-lab and 9 arranged hours)

135. Make-up for Theatre (2)

Theory of make-up for theatre; laboratory applications (2 2-hour activity and 3 hours arranged)

137. Creative Dramatics (2) (Same as E Ed 137)

Basic techniques for the use of dramatization in elementary education; socio-drama, dramatization of school subjects, creative dramatic play.

138. Children's Theatre (2) (Former Drama 159)

Theories of children's theatre and application to problems in production; preparing plays for major public performance. (1 2-hour activity and 6 hours arranged)

139. 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. (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. (2 2-hour activity and 4 arranged hours)

180. Design in the Theatre (3; max total 9) (Same as Art 180)

Prerequisite: Drama 34 or permission of instructor. Theory and laboratory application in scene design, costume, stage and television lighting. (lab hours arranged)

184. Readings in Dramatic Literature (2; max total 6)

Open to upper division students of all departments. Prerequisite: permission of instructor. Reading and discussion of great plays of history.

185A-B. History of the Theatre (3-3)

(A) History of European theatre and component arts from ancient Greece through the mid-nineteenth century; analysis of representative examples. (B) From Ibsen to the present, including history of theatre in America; analysis of representative examples.

189. Projects in Production (2; max total 6)

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 Regulations and Procedures—Independent Study.

194T. Major Writers: Shakespeare (4) (See Engl 194T: Shakespeare)

200 series. Graduate courses are listed under *Speech*.

PUBLIC ADDRESS AND COMMUNICATION

Note: PAC courses were formerly listed under Speech.

24. Persuasion (3) (Former Spch 24)

Prerequisite: Spch 21 or permission of instructor. Persuasion viewed as a social tool for resolving controversy and forming opinions through presentation of and listening to speeches.

25. Argumentation (3) (Former Spch 25)

Prerequisite: Spch 21 or permission of instructor. Logical analysis, evidence, reasoning, and proof used in arriving at rational decisions as demonstrated through presentation of speeches and debates.

26. Group Discussion (3) (Former Spch 26)

Prerequisite: Spch 21 or permission of instructor. Oral communication in the dynamics of group thinking and problem solving through preparation and presentation of panels and symposia.

121. Advanced Oral Communications (3) (Former Spch 121)

Prerequisite: Spch 21 or permission of instructor. Study and application of the theories of oral communication at an advanced level.

125. Rhetorical Theory (3) (Former Spch 125)

Study of rhetorical principles for the purpose of establishing standards for the evaluation of speech making.

126. Group Communication (3) (Former Spch 126)

Prerequisite: Spch 21 or permission of instructor. Analysis of the interrelationships of social groups and communication processes; research projects in problems of intergroup and intercultural communication.

127. Dynamics of Leadership (3) (Former Spch 127)

Theory and practice of leadership in various types of organization; functions of leadership in group dynamics; panels, discussions, and role playing.

170. History of Public Address: Ancient and British (3) (Former Spch 170)

Not open to students with credit in Spch 124. Greek, Roman and British public address; analysis of selected speeches evaluated within the intellectual, social, political, and historical context of those times.

171. History of Public Address: American (3) (Former 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.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Speech*.

RADIO-TELEVISION**15. Radio-Television Laboratory (2; max total 4)**

Prerequisite: permission of instructor. Laboratory experience in major productions for closed circuit or broadcast performance. (4-8 hours arranged)

40. Foundations of Broadcasting (3)

Contemporary broadcasting; historical concepts, regulation; radio-television as instruments of social influence; standards of program criticism.

41. Radio Production (3)

Prerequisite: R-TV 40. Fundamentals of radio production techniques and program planning. (3 lecture-lab and arranged hours)

44. Television Production (3)

Prerequisite: R-TV 40. Fundamentals of television production techniques and program planning. (3 lecture and arranged hours)

115. Advanced Radio-Television Laboratory (2; max total 4)

Prerequisite: permission of instructor. Laboratory experience in major productions for closed-circuit or broadcast performance. (4-8 hours arranged)

128. Motion Picture Evaluation (2)

Criteria for motion picture selection; use of reviews and judgment by critics and organizations; critical observation; appreciation and enjoyment. (2 lecture-lab and arranged hours)

129. Telefilm Production (2; max total 4)

Prerequisite: R-TV 128, permission of instructor. Theoretical and practical application of visualization techniques as applied in the media of television film. (lab hours arranged)

141A-B. Radio and Television Continuity Writing (3-3)

Prerequisite: Engl 1. Application of principles of creative writing to radio and television broadcasting; analysis and writing of radio and television plays; writing skills and standards of criticism. (3 lecture-lab and arranged hours)

142. Radio and Television News Broadcasting (3) (Same as Jour 142)

Prerequisite: Engl 1; Jour 114. All aspects of radio and television news broadcasting; analysis and use of the techniques in editing and writing. (2 lecture, 2 lab hours arranged)

143. Radio and Television in Education (2) (Same as A Ed 143)

Philosophy, objectives, and uses of radio and television in education; place of radio and television in the curriculum, classroom utilization, out-of-school listening and viewing; advantages and limitations of the media; evaluation of school broadcasts.

143L. Radio and Television Education Laboratory (1) (Same as A Ed 143L)

Prerequisite or concurrently: R-TV 143. Experience in production of educational radio and television programs.

144. Advanced Television Production (2)

Prerequisite: R-TV 44. Organization and planning of the television production. (2 lecture-lab and arranged hours)

145. Radio and Television Station Operation and Programming (2)

Prerequisite: R-TV 44. Organization, management, and programming of radio and television stations; correlation of department functions; rules and regulations governing station operation. (2 lecture-lab and arranged hours)

147. Radio and Television Direction (2; max total 8)

Prerequisite: R-TV 41 or 44, permission of instructor. Radio direction: planning and organization of production elements and direction of radio programs for broadcast over local stations. Television direction: planning and organization of production elements and direction of television programs on closed-circuit and over local stations. (lab hours arranged)

149. Radio and Television Performance (3)

Prerequisite: R-TV 40 or 44. Role of the broadcast performer; types of broadcast performance; development of professional skills and standards; laboratory or broadcast participation. (2 lecture, 2 lab hours arranged)

160. Broadcast Regulation (3)

Prerequisite: R-TV 40 or permission of instructor. Types and effects of broadcast regulation; Communications Act, FCC, FTC, industry codes, audience influences.

189. Projects in Radio-Television Production (2; max total 6)

Prerequisite: permission of instructor. Individual projects in all phases of production for closed-circuit or broadcast performance. (4 hours activity)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

200 series. Graduate courses are listed under *Speech*.

SPEECH**10. Administration of Speech Arts Programs (2)**

Organization and management of public events in speech arts. (2 lecture and 7 arranged hours)

15. Speech Arts Laboratory (1-2; max total 4)

Prerequisite: permission of instructor. Group laboratory experience in major presentations and programs in public address and communication. (1 lecture, 6 hours arranged)

20. Fundamentals of Voice and Articulation (3)

Primarily for speech majors and minors. Principles of voice and articulation as needed in various aspects of oral communication.

21. Fundamentals of Oral Communication (3)

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.

22. Fundamentals of Interpretation (3)

Discovering and communicating intellectual and emotional meaning of the printed page through preparation and presentation of selected readings from prose, poetry, and drama.

76. Problems in Oral Expression (2)

Primarily for prospective teachers. Oral presentation of materials; analysis and elimination of individual limitations in oral expression.

110. Administration of Speech Arts Programs (2; max total 4)

Organization and management of public events in speech arts. (2 lecture and 7 arranged hours)

115. Advanced Speech Arts Laboratory (1-2; max total 6)

Prerequisite: permission of instructor. Group laboratory experience in major presentations and programs in public address and communication. (1 lecture, 6 hours arranged)

122. Advanced Interpretation (3)

Study and application of theories of oral interpretation through preparation and presentation of selected readings.

130. Choral Reading (2; max total 4)

Selection of poetry appropriate for choral reading on various educational levels; role of choral reading in speech teaching.

134. Structure of English (3) (See Engl 134)**135. Introduction to Linguistics (3) (See Ling 135)****137. American English (3) (See Engl 137)****158. Speech for the Classroom Teacher (3) (Same as E Ed 158)**

Prerequisite: permission of instructor. Speech needs of teachers; management of speech activities in the classroom; diagnosis of student speech difficulties and techniques for alleviating deficiencies.

189. Projects in Production (2; max total 6)

Prerequisite: permission of instructor. Group projects in all phases of production in public address-communication. (4 hours activity)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

200. Introduction to Graduate Study (2)

Prerequisite: speech minor or equivalent. Seminar in research procedures and materials in speech. Required of all majors in speech arts 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) (Former Spch 222, 224, 239, 244, 247)

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.

253. Seminar in Functional Speech Disorders (3; max total 6)

Prerequisite: Sp Corr 153, 155; permission of instructor. Projects in library research or in experimentation relating to functional speech disorders such as articulation, delayed speech, stuttering, and functional voice disorders.

254. Seminar in Organic Speech Disorders (3; max total 6) (Former Spch 223)

Prerequisite: Sp Corr 154, 155; permission of instructor. Projects in library research or in experimentation relating to organic speech disorders such as cleft palate, cerebral palsy, aphasia, and organic voice disorders. (3 lecture-lab and arranged hours)

255. Advanced Clinical Practice (2; max total 4)

Prerequisite: Sp Corr 153, 154, 155; permission of instructor. Supervised clinical practice in diagnosis and therapy of complex speech and hearing problems; causative factors, outlining plan of therapy, counseling parents, referral considerations. (2 lecture-lab and arranged hours)

260. Seminar in Audiology (3; max total 6)

Prerequisite: Sp Corr 164. Projects in library research or experimentation.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

303. Topics in Speech (1-3; repeatable with different topics)**SPEECH CORRECTION AND AUDIOLOGY****150. Introduction to Speech Correction (3) (Same as A Ed 150)**

Problems of speech correction in education; classification of speech defects, common types, causes and therapeutic procedures; development of normal speech in the child; speech correction in public schools; role of classroom teacher in speech correction program.

151. Phonetics of American English (3)

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. (2 lecture, 2 lab hours)

152. Evaluation of Speech and Hearing Disorders (3)

Prerequisite: Sp Corr 150, 151. Diagnostic and therapeutic procedures applicable to a broad spectrum of speech and hearing problems; tests and methodologies utilized in speech correction. (2 lecture, 2 lab hours)

153. Stuttering (3)

Prerequisite: Sp Corr 150, 152 or permission of instructor. Theories and therapies; psychological and educational concepts of stuttering; parent-child relationships. (2 lecture, 2 lab hours)

154. Speech Pathology (3)

Prerequisite: Sp Corr 152. Causation and therapy procedures for organic speech disorders, including cleft palate, cerebral palsy, aphasia, voice disorders.

155. Clinical Practice in Speech and Hearing Therapy (2; max total 6)

Prerequisite: Sp Corr 152, permission of instructor. Supervised clinical practice in speech and hearing therapy with a variety of speech and hearing problems; diagnosis of speech deficiencies, procedures of referral to other agencies, parent counseling; case records. (6 hours arranged)

156. Voice Science (3)

Prerequisite: Sp Corr 150. Anatomical structures utilized in speech sound production; acoustical properties of sound with respect to pitch, loudness, duration and quality; processes of respiration, phonation, resonance, articulation, including structures involved in each and acoustical modifications that may be effected.

157. Psychology of Speech Development (3)

The normal process of speech development in children; sociological, psychological, and educational concepts relating to the learning of speech. (2 lecture, 2 lab or field hours)

162. Principles of Audiology (3) (Same as H Sc 162)

Anatomy and physiology of the ear; medical aspects of deafness and surgical treatment of hearing loss; psychological and social factors involved; remedial procedures.

163. Principles of Aural Rehabilitation (3) (Same as A Ed 151) (Former Sp Corr 161)

Prerequisite: Sp Corr 162 or permission of instructor. Psychological, educational, and sociological implications of hearing impairments. Hearing conservation programs; education of the hearing impaired. (2 lecture, 2 lab hours)

164. Audiometry (3) (Former Sp Corr 160)

Prerequisite: Sp Corr 162 or permission of instructor. Concepts on perception of speech; testing procedures utilized in detection and evaluation of hearing loss; application of testing procedures for diagnostic and rehabilitative purposes.

200 series. Graduate courses are listed under *Speech*.

SCHOOL OF BUSINESS

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SCHOOL OF BUSINESS

McKee Fisk, Dean

Coordinator, Student Affairs.....Robert E. Hampton
Director, Bureau of Business Research and Service.....Marshall E. Minich
Director, Institute of Industrial Relations.....

ACCOUNTING AND QUANTITATIVE STUDIES DEPARTMENT

Professor: Tidyman (Chairman)
Associate Professors: Bedrosian, Emerson, Parker
Assistant Professors: Drummond, Mitchell, Posey, F. Taylor, Titus
Part-time: Cunningham, Daniel, Michelini

FINANCE AND INDUSTRY DEPARTMENT

Professors: Carr (Chairman), Austin, Fisk, Pierson
Associate Professors: Brooks, I. Davis, Dodds
Assistant Professors: R. Benson, Egenolf, Hanft, O'Brien, Veverka
Lecturer: Minich
Part-time: Soper, Wahlberg

MANAGEMENT AND MARKETING DEPARTMENT

Professors: Halper (Chairman), Jepsen
Associate Professors: Hampton, Reighard
Assistant Professors: D. Anderson, Brock, R. Johnson, Kruger, Singh
Adjunct Professor: Chute
Part-time: Kehlenbeck, D. Lewis

OFFICE ADMINISTRATION DEPARTMENT

Professor: H. Rohrer (Chairman), Wayne
Associate Professor: Wight
Assistant Professors: Agnew, Haggblade

The School of Business prepares students for professional careers in the business world and for teaching in secondary schools and junior colleges. The program is designed to provide a knowledge of the principles, procedures and art 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 such proficiency in technical skills and information as the job market demands.

The school offers bachelor of science degree programs in the four specialized business areas of accounting, business administration, marketing, and office administration, and in agribusiness. A minor and special courses are offered to supplement work in other fields.

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.

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. Such 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 graduate coordinator in the School of Business and the Dean of the School of Graduate Studies.

The School of Business is a member of 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. The Bureau compiles, interprets, and publishes statistics and studies on the local and regional economy, including *Fresno Facts and Trends*, which is published monthly during the regular academic year 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 con-

ducting specific research and service projects; and arranges and conducts executive development and other programs as the need arises.

INSTITUTE OF INDUSTRIAL RELATIONS

In cooperation with labor and management groups in the San Joaquin Valley, the Institute of Industrial Relations offers work both on campus and off campus. It also provides opportunities for students to participate in labor relations programs and to engage in research in the field.

HIGH SCHOOL PREPARATION

In addition to the usual college preparatory courses it is recommended that students include four years of English, mathematics through intermediate algebra, and one year each of typewriting and bookkeeping in their high school programs.

BACHELOR OF SCIENCE DEGREE MAJORS

Majors are offered in the following fields for the bachelor of science degree. See general degree requirements under *Degrees and Credentials*.

The *accounting* major prepares for the California examination for Certified Public Accountant and for positions in governmental, public, internal, and general accounting.

The *agribusiness* major prepares students for positions in businesses allied with agriculture. These include farm credit and finance, agricultural purchasing, processing, and marketing, as well as management and office positions in agricultural industry. The degree requires 128 units including course work in both business and agriculture.

The *business administration* major prepares for positions in the fields of agricultural economics, banking and finance, business and industrial management, small business operation, and personnel administration.

The *marketing* major prepares for positions in retailing and merchandising; in advertising; and in other types of general and specialized marketing work such as specialty selling, sales management, agricultural marketing, and market research.

The *office administration* major prepares students for responsible positions as administrative assistants, office supervisors, and personal and executive secretaries.

MAJOR REQUIREMENTS

Each student desiring to major in a business field must select one of the majors listed below. Except for office administration (which requires 42 units), a minimum of 45 upper division units is required for bachelor of science degree majors. The general regulations and general education requirements for a bachelor's degree must be completed (see *Degrees and Credentials*).

Additional Requirements: Econ 1A-B, Math 51 or 71, 72 or equivalent are required of all majors in the school; IA 60 is required for marketing (advertising) majors; Chem 2A and Physics 2A are required for the agribusiness major, business option, agricultural mechanics area; Chem 2A-B and 8 are required for the animal and plant science areas. Recommended additional courses are: Geog 3, Econ 110, Soc 1A, Psych 145. Demonstrated ability in the use of the typewriter as indicated by a proficiency examination or by credit in a college typing course is also required of all majors in the school.

All majors in the School of Business are required to complete 12 units outside the school in addition to major and general education course requirements.

MAJORS FOR BACHELOR OF SCIENCE DEGREES

(See *Additional Requirements* above)

	<i>Units</i>
Accounting	
Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100.....	27
Acct 120A-B, 132, 144, 162, Bus Ad 160, Acct 140 or 155 or 167.....	21
Elect two courses from the following: Bus Ad 100 or Econ 100A; Bus Ad 104 or Econ 103; Bus Ad 124, 134, 135, 161.....	6
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Agribusiness (Business Option)	
<i>Business Courses</i>	
Acct 1A-B, Bus Ad 100, 102, 110, 118-A-B, 133, 151, Mkt 100.....	30
Elect from: Acct 128, 132, Bus Ad 120, 124, 170, 171, 177, 179, 184, Mkt 102, 108, 140, 150, 176.....	9
<i>Agriculture Courses</i>	
Elect one area.....	30-31
(a) <i>Agricultural Mechanics</i>	
AgM 15, 17, 18A-B, 25, 81, 91, 111, 111L, 115, 116, 121, 151A-B, 159	
(b) <i>Animal Science</i>	
AH 71, 115, 116, 172, Ag 112, 136	
Elect 12 units from one category: AH 1, 22, 30, 40; DS 11A-B, 53, 102; PH 1, 32, 162, 163	
(c) <i>Plant Science</i>	
CP 60, Ag 106, 112, 130, 136, 146	
Elect 12 units from one category: CP 11, 12, 51, 52 or 53 or 56; H 11, 12, 52 or 55, 57; OH 3, 22, 33, 53; V 11, 15, 16, 50	
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	69-70
Business Administration	
Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100.....	27
Bus Ad 100, 120, 124.....	9
Elect from: Acct 120A-B, 128, 132.....	3
Elect 12 units from one of the following areas of concentration, or 6 units from each of two areas. (If fewer than 12 units are listed in an area, all courses listed may be taken but sufficient courses to total 12 units must be selected from one other area).....	12
<i>Accounting</i> : Acct 120A-B (If Acct 120A is selected above, Acct 120B must also be taken), Acct 132 (if not selected above), Acct 140, 144, 162	
<i>Agricultural Economics</i> : Bus Ad 170, 171, 177, 179, Mktg 102	
<i>Business Economics</i> : Bus Ad 104, 161, Mkt 108, Econ 103	
<i>Economics</i> : Elect 6 to 12 units of upper division economics courses	
<i>Finance</i> : Bus Ad 132, 134, 135, 139, Econ 131	
<i>Insurance</i> : Bus Ad 143, 144	
<i>Legal Environment of Business</i> : Bus Ad 119, 156, 184, Econ 174	
<i>Marketing</i> : Mkt 106, 108, 130, 140, 150, 155, 176, Bus Ad 137	
<i>Office Administration</i> : Off Ad 103, 105, 107	
<i>Personnel and Industrial Relations</i> : Bus Ad 152, 153, 154, 156, 159, Econ 150, Psych 181	
<i>Quantitative Techniques and Applications</i> : Bus Ad 104, 160, 161, 165, Mkt 108	
<i>Real Estate and Land Economics</i> : Bus Ad 180, 181, 183, 184, 186	
<i>Transportation</i> : Bus Ad 107, 109, Econ 170	

Marketing	<i>Units</i>
Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 10 or 100	27
Mkt 106, 140, 150	9
Elect one subject field:	13-17

- (a) *General Marketing*
 Bus Ad 100, 137, Mkt 105, 108, 155
 Elect one: Econ 170, Mkt 176
- (b) *Advertising*
 Mkt 108, 141, 144, Jour 145A-B; and Art 101 or Jour 17A
 Elect 3 units from: Jour 106, 113, Mkt 105, 199
- (c) *Retailing*
 Mkt 130, 132, 134, 199 (2 un), Jour 145A
 Elect one: Mkt 105, Bus Ad 137, 143, Jour 145B

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Office Administration

Acct 1A-B, Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100	27
Bus Ad 160, Off Ad 4, 103, 105, 107	15
Elect from one of the following series:	9
(a) Off Ad 112, 114, 121	
(b) Acct 120A or 128 or 132; 6 units from Bus Ad 137, 143, 153, 161	

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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 15-16 units per semester. Math 51, or 71 and 72, or equivalent is required. A total of 124 units must be completed for the bachelor of science degree (128 for degree in agribusiness). (See also *Degrees and Credentials*.)

Accounting

- 1st Year: Typing exam or Off Ad 1 or 2, Math 51
 2nd Year: Acct 1A-B, Econ 1A-B
 3rd Year: Acct. 120A-B, 132, Bus Ad 102, 110, 118A-B, 133, 151, 160, Mkt 100
 4th Year: Acct 144, 162, Acct electives (3 un); approved Bus Ad and Econ electives

Agribusiness

- 1st Year: Typing exam or Off Ad 1 or 2, Math 51, approved agriculture electives (6 un)
 2nd Year: Acct 1A-B, Econ 1A-B, approved agriculture electives (6 un)
 3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, 170, Mkt 100, approved agriculture electives (6 un)
 4th Year: Bus Ad 100, 179, Mkt 102, approved business electives (6 un), approved agriculture electives (12 un)

Business Administration

- 1st Year: Typing exam or Off Ad 1 or 2, Math 51
 2nd Year: Acct 1A-B, Econ 1A-B
 3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100, Acct elective (3 un)
 4th Year: Bus Ad 100, 120, 124, approved electives (12 un)

General Marketing

- 1st Year: Typing exam or Off Ad 1 or 2, Mkt 10, Math 51
 2nd Year: Acct 1A-B, Econ 1A-B
 3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 105, 140, 150
 4th Year: Bus Ad 100, 137, Mkt 106, 108, 155, Econ 170 or Mkt 176

Marketing-Advertising

- 1st Year: Typing exam or Off Ad 1 or 2, Mkt 10, IA 60, Math 51
 2nd Year: Acct 1A-B, Econ 1A-B
 3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 140, 150, Jour 145 A-B
 4th Year: Mkt 106, 108, 141, 144; Art 101 or Jour 17A; field elective (3 un)

Marketing-Retailing

- 1st Year: Typing exam or Off Ad 1 or 2, Mkt 10, Math 51
 2nd Year: Acct 1A-B, Econ 1A-B
 3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 140, Jour 145A
 4th Year: Mkt 106, 130, 132, 134, 150, 199, field elective (2-3 un)

Office Administration

- 1st Year: Typing exam or Off Ad 1 or 2, 4, Math 51
 2nd Year: Acct 1A-B, Econ 1A-B
 3rd Year: Bus Ad 102, 110, 118A-B, 133, 151, Mkt 100, Off Ad 103, 105, approved electives (3 un)
 4th Year: Bus Ad 160, Off Ad 107, approved electives (6 un)

BUSINESS MINOR

The following business minor is offered for students with majors in other departments. Satisfactory skill in the use of the typewriter as demonstrated by a proficiency examination or credit in Off Ad 1 or 2 or equivalent is required of all minors.

	<i>Units</i>
Acct 1A	3
Elect from: Bus Ad 102, 110, 118A, 133, 151, Mkt 100	6
Elect from not more than two fields (8 ud): Acct, Bus Ad, Mkt, Off Ad	11
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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 ARTS DEGREE

The master of arts degree program in business has been discontinued and no further applicants will be accepted. This program has been replaced by the master of business administration and master of science degree programs. Students who, before September 1965, had signed a declaration of intent to work toward the master of arts degree in business will be permitted to complete the program provided reasonable progress is maintained. 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.

MASTER OF SCIENCE DEGREE

The master of science degree is available for students in specialized programs in business. For details, consult the school coordinator of graduate affairs.

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 or equivalent preparation 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.

Admission to a master's degree program in business (classified standing) generally requires meeting at least two of the following criteria: (1) an undergraduate grade point average of at least 2.5 (on a 4-point scale); (2) a score of at least 450 on the Admission Test for Graduate Study in Business; (3) a score of at least 520 on the Graduate Record Examination Advanced Test in Business. The Admission Test must be taken before admission.

A passing score in the Graduate Record Examination Advanced Test in Business is required for Advancement to Candidacy. It should be taken at the conclusion of the undergraduate major in business or at the conclusion of the first year of the two-year program.

Scores on both tests should be sent to the Fresno State College Test Office.

First Year*Units*

Specified course in each: accounting, business finance, business law, business management, business statistics, economics, marketing, personnel management, production analysis 27

Second Year

Bus 200, 220, 223, 261, 291 or at least 3 units in 299 15
 Approved electives in business, economics, engineering, or related fields (including a concentration of units excluding core courses above) 12-15
 (The program must include at least 27 units in the 200 series. Students entering directly into the second year of the program are required to have 30 units in the 200 series.)

Additional Requirements: Other courses may be specified after examination of the student's record and his performance on the Admission Test for Graduate Study in Business or the Graduate Record Examination Advanced Test in Business, which should be taken as early as possible.

Courses
ACCOUNTING

1A-B. Principles of Accounting (3-3)

Not open to freshmen. Introduction to accounting and to business administration; theory of modern accounts; debit and credit; classification of accounts; procedures of recording transactions; preparation of balance sheets, profit and loss statements.

120A-B. Intermediate Accounting (3-3)

Prerequisite: for 120A, Acct 1A-B; for 120B, Math 51 (may be taken concurrently). 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, and reserves.

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. Uses of accounting data as an aid in business management; nature of accounting data, uses and limitations.

132. Cost Accounting (3)

Prerequisite: Acct 1A-B. Introduction to industrial cost accounting; general principles of job-order, process and standard cost systems; special problems.

140. Controllership (3)

Prerequisite: Acct 128 or 132. Controller functions in decision-making processes, internal control and auditing, accounting planning models, accounting control models, accounting as an information system.

144. Federal Tax Accounting (3)

Prerequisite: Acct 120A. Tax laws of the United States as they affect business and accounting procedures; preparation of personal, partnership, and corporate income tax returns; computation of capital stock, excess profits, estate, gift, and excise taxes.

155. Governmental Accounting (3)

Prerequisite: Acct 120A or 132. Accounting and financial reporting for municipal, county, state, and federal governments and institutions; budgetary control; types of funds; interpretation of governmental reports.

162. Auditing (3)

Prerequisite: Acct 120A-B (120B may be taken concurrently). Verification of accounts of a business to determine financial condition, operating results, and financial integrity of those in charge; duties and responsibilities of the auditor, his function in the executive staff and relation to the accounting department; balance sheet audit.

167. Advanced Accounting Problems (3)

Prerequisite: Acct 120A-B, or 120A and senior standing. Advanced accounting theory and practice; type problems in partnerships, consignments, installment sales, insurance, annuities, receiverships, branches, parent and subsidiary accounting, estates and trusts.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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*.

BUSINESS ADMINISTRATION**8. Introduction to Business Law (3)**

For nonbusiness students. Legal concepts common to all; rights, duties, and obligations in the law of contracts, sales and business torts; functioning of judicial institutions.

10. Foundations of the Enterprise System (3)

American business enterprises and their functions; case studies and practical problems illustrating current practices in business organization for production, distribution, and finance.

21. Business Mathematics (2)

Not open to students with credit in Bus Ad 22, Ag 27, Math 2 or 51. Fundamental operations and arithmetical processes; equations and use of formulas; application to specialized fields.

22. Business Data (3)

Not open to students with credit in Bus Ad 102. Prerequisite: one year high school algebra. Application of mathematical processes to business: marketing, economics, finance; introduction to statistics; compilation and classification of data.

50. Business Lectures (1; max total 2)

Not open to freshmen. Points of view of business executives on current business developments; problems of various businesses presented by visiting lecturers.

61. COBOL Programming (1)

Introduction to the use of a compiler, oriented toward the handling of business data; study of the structure of COBOL (Common Oriented Business Language), organization of data and files, practice in COBOL processing.

100. Business Economics (3)

Prerequisite: Bus Ad 133, 151; senior standing. Application of economic principles in business management; measure of profit, analysis of demand, cost analysis; price, wage, and public policies; case studies.

102. Business Statistics (3)

Primarily for juniors. Prerequisite: Math 51 or equivalent; Econ 1A-B. Recommended: Off Ad 16. Principles and methods of statistical analysis; application to business and economic problems; descriptive statistics, introduction to probability, statistical inference, index numbers, time series analysis, correlation and regression analysis. (2 lecture, 2 lab hours)

104. Business Forecasting (3)

Prerequisite: Bus Ad 102. Analysis of forecasting techniques currently utilized to estimate cyclical and secular-trend changes in both firm and industry output; correlation techniques, models, composite indexes; time series, lead-lag, and flow-of-funds analyses.

107. Transportation Management (3)

Prerequisite: Econ 1A-B. Movement of goods and people; comparison of alternatives; firm management; national transportation policy; significance of transportation to industrial location, pricing, and markets.

109. Industrial Traffic Management (3)

Prerequisite: Bus Ad 107 or Econ 170. Physical distribution systems; cost and service comparisons of transportation alternatives; impact of legal restrictions and regulatory controls. Organization and operation of traffic departments.

110. Principles of Management (3)

Primarily for juniors. Art, science, and theory of management, universal functions of the manager. Use of the case method to develop analytical skills and administrative orientation.

118A-B. Business Law (3-3)

Prerequisite: junior standing. (A) Sources, forms and expressions of law; general law of contracts; law of agency and employment; case studies. (B) Law of bailments, shipments; sale of personal property; negotiable instruments; personal property security; case studies.

119. Advanced Business Law (3)

Prerequisite: Bus Ad 118A-B. Law of partnerships, corporations, estates, real property acquisition, conveyances and transfers; encumbrances such as easements, leases, mortgages and liens; riparian rights and boundaries; wills, administration of estates, bankruptcy, debtor and creditor relations, surety; case studies.

120. Management Problems and Policies (3)

Prerequisite: Bus Ad 100; senior standing. Analysis of business operations by case study, actual investigation, research and study; business policy, structural organization, and principles of management.

124. Production Management (3)

Not open to students with credit in Bus 125G. Prerequisite: Bus Ad 102, 110. Problems of production management: production planning; production control; purchasing and procurement; materials planning and control; product development; plant location. Field trip required.

129. Association Management (3)

Prerequisite: Bus Ad 110. Principles of management and operational problems applicable to chambers of commerce, trade associations, and similar community organizations.

132. Financial Institutions (3)

Prerequisite: Econ 1A-B, Acct 1A-B. Theory of financial system and intermediation; gross and net money doctrines; financial institutions; sources of funds; case studies.

133. Business Finance (3)

Prerequisite: Econ 1A-B; Acct 1A-B. Theory of financing the business firm under conditions of uncertainty. The supply of and demand for capital; asset management and capital structure analysis, cost of capital and the capital budgeting decision.

134. Investments (3)

Prerequisite: Bus Ad 133. Channels for investment of funds; investment characteristics of stocks, bonds, and real estate mortgages; fundamentals of investment analysis; investment safeguards and investment policies.

135. Monetary Theory and the Banking System (3)

Not open to students with credit in Econ 135. Prerequisite: Econ 1A-B. Monetary systems, exchange standards, international exchange, price stabilization; the banking system.

137. Principles of Credit Management (3)

Nature and principles of mercantile and consumer credit in modern business; derivation of credit information from business data; credit agencies and credit bureaus; valuation and ratio analysis of financial statements; technical and legal aspects of collections.

139. Financial Management (3)

Prerequisite: Bus Ad 133. Case studies and analysis of financial policies of business enterprise from the executive viewpoint; principles of effective management of the flow of funds through the individual firm under changing economic conditions; evaluation of alternative methods of financing, capital budgeting, valuation problems.

143. Risk and Insurance (3)

Prerequisite: Bus Ad 8 or 118A (may be taken concurrently). Fundamental principles of insurance; descriptive, nontechnical study of property and casualty insurance and insurance carriers.

144. Life Insurance (3)

Prerequisite: Bus Ad 8 or 118A (may be taken concurrently). Principles of life insurance, nature and use, scientific basis, types and forms; organization, management and supervision of life insurance companies.

151. Personnel Management (3)

Primarily for juniors. Human relations in industry; case studies of labor-management relationship; methods of recruitment, selection, training; wage-payment plans; employee services, labor laws and application; collective bargaining methods and policies.

152. Labor Relations and Collective Bargaining (3)

Prerequisite: Bus Ad 151 or Econ 150. Relations between employers and organized employee groups; organization, election, and certification procedures; techniques of collective bargaining; basic clauses in labor contracts and their economic significance; administration of the written agreement; mediation and arbitration of disputes; determinants of labor-management conflict and peace.

153. Human Resources in Industry (3)

Prerequisite: Bus Ad 151. Knowledge and skills leading to effective interpersonal relations; understanding one's self as leader and others as individuals and members of working groups; practice in group leadership; sensitivity training.

154. Wage and Salary Administration (3)

Prerequisite: Bus Ad 151. Interaction of economic forces and institutional factors in wage determination; techniques of establishing wage programs; theory and procedures of job evaluation; establishment of job classifications and pay structures; wage determination under collective bargaining; incentive wage plans; special problems in wage and salary administration.

156. Labor Law (3)

Prerequisite: Econ 1A-B; Bus Ad 118A-B, 151. Recommended: Bus Ad 152, Econ 150. State and federal labor statutes, workmen's compensation, social security; procedures and methods in handling labor problems; leading decisions of courts and other bodies in settling labor-management disputes.

159. Field Work in Labor Relations (2; max total 4)

Prerequisite: Bus Ad 152. Consultations with labor and management representatives; observation of union meetings, grievance hearings, National Labor Relations Board proceedings, and contract negotiations; participation in planning and publicizing educational conferences. Group meetings and individual conferences.

160. Automation and Data Processing (3)

Prerequisite: Bus Ad 102 or equivalent. Records, reports and information in business, governmental, and industrial organizations; analysis of procedures, charting, form design, and control necessary to automation; survey of data processing machines and computers, principles; impact of automation on business and society. One field trip required.

161. Principles of Operations Research (3)

Prerequisite: Math 29, Bus Ad 102. Quantitative methods in solving business problems; applications by various industries in fields of linear programming, queuing problems, inventory control problems, cost-value models, and problem simulation.

165. Work Simplification (2)

Not open to students with credit in Bus 125G. Recommended: work experience. Basic principles of motion economy and industrial engineering applied to office and shop; flow process charts, man and machine charts; social and personnel problems involved in work simplification procedures.

169. Practicum in Computer Programming (1-3; max total 3)

Prerequisite: Bus Ad 61, 160, Engr 70, or familiarity with IBM 1620 programming. Developing design and test models suitable for computer programming, with emphasis on accounting systems and simulation problems.

170. Agricultural Production Economics (3)

Prerequisite: Econ 1A-B. Study combining the resource structure and organization of agriculture as an industry with the application of economic principles in agricultural production.

171. Rural Land Economics (3)

Prerequisite: Econ 1A-B. Rural land use problems, policies and programs; land and water resource development; population influences.

177. Agricultural Finance (3)

Prerequisite: Econ 1A-B. Analysis of agricultural credit problems; acquisition and management of capital; financing the farm business enterprise.

179. Agricultural Policy (3)

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. Urban Land Economics and Real Estate Principles (3)

Prerequisite: Econ 1A-B. Real estate principles and urban land economics; processes and patterns of land utilization where man and his artifacts are assembled in communities; determination of urban land use in a market process; economic competition among alternative uses; case studies.

181. Valuation of Real Property (3)

Prerequisite: Bus Ad 180. Theory of real property value; historical development; methods used in urban, and rural property appraisals; special purpose appraisals. Field work required.

183. Urban Real Estate Investment and Management (3)

Prerequisite: Bus Ad 180. Case studies and problems in the acquisition, development, management, and sale of investment properties; for those interested in leasing, investing, or trading in real estate. Guest lecturers for certain specialized phases.

184. Real Estate Law (3)

Prerequisite: Bus Ad 118A-B or equivalent. Legal aspects of acquisition and ownership of real estate, especially in California; conveyances, mortgages, evidences of title; planning and zoning.

186. Land Use in Urban Areas (2)

Prerequisite: Bus Ad 180 or equivalent. Urban growth and development as a function of relative land values in different uses; real estate economics in relation to the use of land; urban growth as a result of investment decisions; analysis of such decisions.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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; analyzed in weekly class meeting.

200 series. Graduate courses are listed under *Business*.

MARKETING**10. Introduction to Marketing (3)**

Students with credit in Mkt 10 may not take Mkt 100 for credit. Distribution of goods and services from the producer to the consumer, with emphasis on the products of the San Joaquin Valley; marketing functions—buying, selling, transporting, storing, standardizing and grading, risking, and financing.

100. Principles of Marketing (3)

Primarily for juniors. Not open to students with credit in Mkt 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.

102. Marketing of Agricultural Products (3)

Basic marketing functions, policies, and problems involved in handling agricultural products; economic concepts, business decisions, and practical applications.

105. Economics of Consumption (3)

Prerequisite: Econ 1A-B. Theory of consumption and consumer demand; analysis of the relation of the consumer to the price system; survey of efforts to improve the position of the consumer.

106. Marketing Problems (3)

Prerequisite: Mkt 10 or 100; 108 or 130 (may be taken concurrently). Distribution of goods and the rendering of services; case studies and current thought on problems of marketing, institutions and practices, from the standpoint of theory and technique.

108. Marketing Research (3)

Prerequisite: Econ 1A-B; Mkt 10 or 100; Bus Ad 102 (may be taken concurrently). Fundamentals of market and marketing analysis, research procedure, methods of analysis, applications of statistical techniques to market analysis, and presentation of results.

130. Principles of Retailing (3)

Prerequisite: Mkt 10 or 100. Various kinds of retailing organizations, their structure and management; store policies, merchandise control, personnel, retail credit, and store management.

132. Retail Buying (2)

Prerequisite: Bus Ad 22, Mkt 130, or equivalent. Problems of buying merchandise for resale; sources and markets; basic factors in planning, selecting, buying, pricing and selling of retail merchandise.

134. Merchandise Information (2)

Composition and construction of various kinds of retail merchandise; raw materials; line, color and design.

140. Introduction to Advertising (3) (Same as Jour 140)

An informational course for nonadvertising majors and an overview for advertising specialists. Social and economic functions of advertising; copy, art, layout production methods, media, campaigns, and advertising research.

141. Advertising Production and Media (2) (Same as Jour 141)

Prerequisite: Mkt 140 or equivalent. Techniques of advertising production; letterpress, photoengraving, lithography, silk-screen, typography, multicolor processes, and television; advantages and disadvantages of major media—newspapers, magazines, outdoor and poster advertising, direct mail, radio, television. Field trips are required.

144. Advertising Campaigns (2) (Same as Jour 144)

Prerequisite: Mkt 140. Market research, selection of campaign themes, copy preparation, art, and layout in various media for selected products and services; creating advertisements.

150. Principles and Psychology of Salesmanship (3)

Personal factors and techniques influencing other people; personal development, types of customers, mental and emotional appeals; mechanics and techniques of salesmanship.

155. Sales Management (2)

Prerequisite: Mkt 100, 150, or equivalent. Sales administration, planning and execution; marketing policies; planning and promotion; department organization; selection, training and management of the sales force; choice of channels of distribution; market research and analysis; and budgetary control.

176. International Marketing (3)

Prerequisite: Mkt 10 or 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.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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*** 1. Basic Typing (2)**

Development of typewriting techniques and their applications to practical usage. Students with one or two semesters of high school typewriting should enroll in Off Ad 2. (5 lab hours)

*** 2. Intermediate Typing (1)**

Prerequisite: Off Ad 1 or equivalent. Students with more than one year of high school typing should enroll in Off Ad 4. Review of keyboard; development of typewriting technique and its application to business situations. (3 lab hours)

*** 4. Office Production (3)**

Prerequisite: Off Ad 1, or equivalent, or permission of instructor. Modern office production standards, planning, layout, execution; use of offset, mimeograph, and fluid duplicators; electric typewriters; advanced problems.

16. Machine Calculation (2)

Basic operations in use of rotary calculators. (6 lab hours)

† 23. Gregg Shorthand (4)

Not open to freshmen. Prerequisite: adequate typing ability. Acquisition of proficiency in writing and transcribing shorthand notes.

103. Principles of Office Management (3)

Office management in business and industry; organization and control of office services; selection, training, and supervision of personnel; improvement of office efficiency; office planning and layout; equipment and supplies.

* Not more than six units of credit in typing will be allowed toward any degree.

† Not more than ten units of credit in shorthand, dictation, and transcription will be allowed toward any degree.

105. Business Communication (3)

Prerequisite: Engl 1 or 3 and junior standing. Communications in business; development of skills needed for effective business writing and dictating.

107. Records Management (3)

Records organization, management, and control; basic principles and procedures in alphabetic, geographic, numeric, and subject filing.

***112. Advanced Shorthand (3)**

Prerequisite: Off 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: Off Ad 112 or equivalent (may be taken concurrently). Transcription from shorthand and machine dictation; development of production standards for office transcription.

121. Office Services and Procedures (3)

Prerequisite: Off Ad 114 or equivalent. Duties and responsibilities of executive secretarial positions. (3 lecture, 3 lab hours)

190. Independent Study (1-3) max see reference)

See Regulations and Procedures--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.

GRADUATE COURSES

(See Course Numbering System--Definitions and Eligibility)

BUSINESS

100G Series (open only to graduate students)

101G. Fundamentals of Economics (3)

Not open to students with credit in Econ 1A-B. The pricing process in commodity and factor markets; national income analysis, income determination, and rates of growth.

105G. Essentials of Accounting (3)

Not open to students with credit in Acct 1A-B. Basic accounting concepts; account construction; statement preparation, utilization, and interpretation; alternative bases of valuation in measurement of income and financial condition.

108G. Quantitative Methods in Business (3)

Not open to students with credit in Bus Ad 102. Statistical analyses in business: tests of hypotheses, time series, correlation analyses, index numbers, estimation models and Bayesian statistics in business decision making.

115G. Legal Environment of Business (3)

Not open to students with credit in Bus Ad 118A-B or 119. Basic course in business law for master's degree students; nature of the legal system as it relates

* Not more than ten units of credit in shorthand, dictation, and transcription will be allowed toward any degree.

to business; law of contracts, sales, negotiable instruments, business associations (agency, partnerships, corporations).

121G. Organization and Management Theory (3)

Not open to students with credit in Bus Ad 110. Principles of management applied to business organization, structure of plans and decisions, business objectives, policies, functions, executive leadership and control; current management concepts.

125G. Production Analysis (3)

Not open to students with credit in Bus Ad 124 or 165. Prerequisite: Bus 108G, 121G or concurrently, or equivalent. Critical comparison of historical and newer techniques in production planning, scheduling, inspection, control; impact of electronic data processing on inventory, quality control, method, layout and work measurement, assembly line balancing.

130G. Principles of Finance (3)

Not open to students with credit in Bus Ad 133. Principles of finance from the management viewpoint, emphasis upon financial management problems and policies; role of commercial banks, institutional, and other investors in supplying funds.

145G. Marketing Organization and Policies (3)

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.

150G. Manpower Management (3)

Not open to students with credit in Bus Ad 151. Principles and methods of the acquisition and utilization of human resources in organizations; staffing; compensation and motivation; communications; employee evaluation; labor relations.

200 Series (open only to graduate students in classified standing except that credential candidates may take Bus 280, 281, 282 in unclassified standing.)

200. Seminar in Business Research (3)

Methods of research; applications to business problems.

201. Seminar in Managerial Economics (3)

Prerequisite: Bus 101G, 108G, or equivalents. Economic analysis of managerial problems; theory of the firm.

203. Seminar in Office Management (3)

Managerial control of office functions, services, and personnel; case studies.

215. Seminar in Private Enterprise (3)

Prerequisite: Bus 115G or equivalent. Development of legal controls of business; constitutional problems; legal aspects of business organization; anti-trust laws and competition, securities regulation, consumer protection.

220. Seminar in Business Policy (3)

Prerequisite: Bus 121G or equivalent. Seminar in 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.

223. Seminar in Organizational Behavior (3)

Prerequisite: Bus 150G or equivalent. 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.

225. Seminar in Production Management (3)

Prerequisite: Bus 125G or equivalent. Seminar in recent production management theories and problems; critical analysis and review of present practices and theories.

232. Money and Capital Markets (3)

Prerequisite: Bus 130G or equivalent. Analysis of money and capital markets, their organization and role in economic activity.

233. Seminar in Business Finance (3)

Prerequisite: Bus 130G 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 145G 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 145G or equivalent. Seminar in the 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 and Industrial Relations (3)

Prerequisite: Bus 150G 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 Management-Union Relations (3)

Prerequisite: Bus 150G or equivalent. Background and process of collective bargaining; strategy techniques in contract negotiations; analysis of provisions of labor contracts; problems of contract administration; arbitration procedures; pathways to peace in management-union relations; practice in negotiating a labor contract. Individual research.

260. Seminar in Accounting Theory (3)

Prerequisite: Bus 261 or equivalent. Seminar in 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. Accounting Control and Reporting (3)

Not open to students with credit in Acct 120A-B, 132. Prerequisite: Bus 105G 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.

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 108G, 125G, or equivalent. Quantitative analysis of business problems; development of models, simulation and matrices; applications.

265. Business Systems (3)

Prerequisite: Bus 261, Acct 162, or equivalent. Seminar in principles of business system design, installation, and evaluation.

270. International Business (3)

The economic, social, and political environment of the multinational enterprise; policies, practices, and problems of the firm in the international setting.

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. Principles of Business Education (3)

Seminar in objectives, principles, and curricula of business in secondary schools, including junior colleges; evaluation and trends of current programs.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

367. CPA Review (4)**380T. Topics in Business (2; may be repeated if no topic repeated)****389. Workshop in Business Education (1-6; max total 6)****398. Business Internship (1-6; max total 6)**

SCHOOL OF EDUCATION

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SCHOOL OF EDUCATION

Richard K. Sparks, Dean

Department

Chairman

Elementary Education.....	Glenn F. Leslie
Laboratory School.....	David Haimbach
Secondary Education.....	Edwin J. Swineford
Advanced Studies.....	Morris L. Bigge (fall), Orley W. Wilcox (spring)
Coordinator, Graduate Programs.....	Peter G. Fast
Coordinator, Teacher Education.....	John E. Martin

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 master of arts degree programs offered by the various departments within the school permit concentration in any of these areas. Internship programs are offered for selected candidates seeking a standard teaching credential with specialization in either elementary or secondary teaching. An internship program for the training of teachers of culturally disadvantaged children, Operation Fair Chance, has been authorized by the California State Board of Education for the years 1966-1969. Bachelor's degree majors in education are also offered on a limited basis.

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 College. 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*.

The Standard Teaching Credential

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

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

With a Specialization in Health (See *Health Science 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 one of the major-minor combinations listed in the tables 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****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.

B. Nonacademic single subject commonly taught in public elementary schools

28 semester hours at upper division or graduate level.

C. Academic subject not commonly taught in public elementary schools

24 semester hours at upper division or graduate level.

D. Nonacademic subject not commonly taught in public elementary schools

24 semester hours at upper division or graduate level.

Minors

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.

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.

Two minors of 12 semester hours each, one academic. The other may be nonacademic or in an area of specialized preparation.

Two minors of 12 semester hours each, both academic.

Secondary Specialization (Minimum Requirements)**Majors****A. Academic subject commonly taught in public high schools****B. Nonacademic subject commonly taught in public high schools****C. Academic subject not commonly taught in public high schools****Minors**

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.

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.

Two minors of 20 semester hours each, one academic. The other may be nonacademic or in an area of specialized preparation.

Secondary Specialization (Minimum Requirements)**Majors**

D. Nonacademic subject not commonly taught in public high schools

Minors

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 College the majors so defined include that in general agriculture. To determine whether a proposed 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*.

EDUCATION MAJOR

The major in education consisting of 24 semester units of upper-division work may be used as a basis for the bachelor's degree. Students selecting education as a degree major must also present a subject matter major in order to qualify for a teaching credential. Students desiring to major in education should consult the Dean of the School of Education.

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 specialization must present a minimum grade point average of 2.25 in the total college program. Candidates for credentials with secondary specialization must present a minimum grade point average of 2.50 in the total college program. A grade point average of at least 2.0 must be maintained in all work taken at Fresno State College.
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 pass a special medical examination by the staff of the college Student Health Service. Each candidate must make an appointment with the college physician and have this examination completed 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 requirement is met by securing clearance statements in writing from both the English and Speech Arts 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.

Additional requirements must be met by students seeking admission to the professional master's degree programs. For further information regarding these requirements, the department offering the desired degree should be consulted. The School of Education Graduate Office provides 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*.

ELEMENTARY EDUCATION DEPARTMENT

Professors: Leslie (Chairman), Haimbach, Rippey
 Associate Professors: Avery, Bakkegard, Dandoy, Fast, Henfling, Lambert, J. E. Martin, T. Rea, Sloan, C. Smith
 Assistant Professors: Knaupp, Lundberg, Randolph, Reitman
 Lecturer: Hodgens
 Part-time: Ham, Rosander, E. P. Simpson, Wienke

Laboratory School

Principal: Haimbach
 Teachers (grades): Bakkegard (Music), Bowers (K-1), Cady (4), Dow (2-3), Durando (2-3), Gerard (K-1), Meeker (6), Silvani (5)
 Librarian: Berry
 Nurse: Emler

The Elementary Education Department provides professional preparation for the standard teaching credential with specialization in elementary teaching. The department also offers a program leading to the master of arts degree in education with concentration in elementary teaching.

COOPERATING PUBLIC SCHOOL DISTRICTS

The professional preparation program of the Elementary Education Department utilizes the services and facilities of a number of cooperating public school districts in the area for assignments in observation and student teaching. Public school teachers, administrators, consultants, and other personnel provide excellent opportunities for students to gain practical experience in the field.

The following school districts are currently cooperating in the college program of elementary education:

Clovis Unified
 Fresno City Unified

Fresno Colony
 Madera Unified

COLLEGE LABORATORY SCHOOL

The College Laboratory School is of special interest to students preparing for teaching and related fields. The school's philosophy, facilities, and program reflect the interest of the people of California for the education of their children. The school functions to provide demonstration, observation, participation, leadership, and some experimentation and research through its facilities and personnel to all persons interested in professional preparation and improvement. Group demonstrations and individual study may be arranged in connection with courses taught on the college campus and as a service to educational units in the service area of Fresno State College. A diagnostic reading clinic provides limited service in the diagnosis of reading difficulty. The school consists of a kindergarten and six elementary grades housed in a modern elementary school surrounded by five acres of fenced campus. A children's library with more than 4,500 books is available within the school for use by college students as well as the pupils enrolled in the school. Selected teachers guide the program of studies for pupils in each grade. The curriculum of the elementary school implements the accepted *Framework for Public Education in California*. The school provides a laboratory in which students, in-service teachers, administrators, and parents may develop their understanding of children and of educational concepts and methods by observing and working with children. Demonstrations, observation, and individual study opportunities may be used in connection with such classes as psychology, growth and development, curriculum, arts, vocal and instrumental music, physical education, home economics, and family life education.

THE STANDARD TEACHING CREDENTIAL WITH SPECIALIZATION IN ELEMENTARY TEACHING

Candidates for the Standard Teaching Credential with Specialization in Elementary 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. 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. For additional information concerning this aspect of the new credential law, consult the department chairman. 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 State Department of Education.

Candidates for the Standard Teaching Credential with Specialization in Elementary Teaching must complete the following requirements:

General Education

The general education requirements for credential candidates can be met by fulfilling the general education requirements for the baccalaureate degree with the following inclusions and additions:

1. A year of English, in addition to competency in composition, is required. Competency in composition is demonstrated by a grade of "C" or better in English I or its equivalent. The recommended sequence to meet the English requirement is English 1, 20, 134. Deviations from this sequence should have the approval of the Chairman of the Elementary Education Department. (See *Degrees and Credentials—General Education Requirements*)
2. A course of at least three units in the arithmetic and algebra of the real number system is required. This requirement may be satisfied by (a) Mathematics 140, (b) a similar course with a prerequisite of high school algebra and geometry, or (c) a college level course in calculus. (See *Degrees and Credentials—General Education Requirements*)

Majors

The candidate for the Standard Teaching Credential with Specialization in Elementary Teaching 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

The minimum professional requirements necessary to qualify for the Standard Teaching Credential with Specialization in Elementary Teaching include 21-22 units in the following courses:

	<i>Units</i>
E Ed 105, 107A-B, 132A-B.....	19
Elect one course from: E Ed 100, S Ed 184, 186, 187.....	2-3
	21-22

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.

Internship

An internship which permits the student to teach on a half-time salaried basis while he is completing the 30 units of postgraduate work required for the credential may be arranged for superior students in the elementary teaching credential program. Plans for entering the program should be made at the beginning of the senior year. Consult the chairman of the Elementary Education Department for details.

BACHELOR OF EDUCATION DEGREE

Students enrolled prior to July 1, 1964, in a program leading to the bachelor of education degree will be allowed to continue the program provided they hold a regular California provisional kindergarten-primary or provisional general elementary credential (see department chairman).

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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

*Courses***ELEMENTARY EDUCATION (E Ed)****100. School and Society (3) (Former Ed, S Ed 100)**

Prerequisite: Soc. 1A or Anthro 2, or permission of instructor; admission to credential program. Function of education in American culture; role of the school and the teacher; impact of social conflict on the school's function; relationship between school and community; designated field experiences.

105. Development and Learning (3) (Former Ed 185, A Ed 105)

Prerequisite: admission to credential program. Facts, ideas, and principles fundamental to an understanding of educational procedures in teaching and learning, and to the growth and development of children.

107A. Curriculum and Instructional Materials and Procedures (3)

Prerequisite: E Ed 105, 131A (concurrently); admission to credential program. Current conceptions of reading, spelling, written and oral communications; their roles in the elementary curriculum; effective teaching procedures.

107B. Curriculum and Instructional Methods and Procedures (4)

Prerequisite: E Ed 107A, admission to credential program. Current conceptions of history, geography, civics and the sciences; their roles in the elementary curriculum; effective teaching procedures, including audio-visual techniques.

110. General Methods of Teaching (2) (Former Ed 159) (See S Ed 110)**111. Social Studies in the Elementary School (3) (Former Ed 101)**

Prerequisite: E Ed 105, admission to credential program. Teaching the social studies; points of view, materials, unit planning, and procedures; contributions of other subjects to an adequate social studies program.

112. Reading in the Elementary School (3) (Former Ed 102)

Prerequisite: E Ed 105, admission to credential program. Concept of reading as a process; foundations of reading instruction; methods, materials, and instructional aids for teaching reading in the elementary school.

113. Language in the Elementary School (2) (Former Ed 103)

Prerequisite: E Ed 105, admission to credential program. Objectives, curriculum, materials, and procedures in language, spelling, and handwriting.

114. Children's Literature (3) (Former Ed 104)

Prerequisite: E Ed 105. Standards of selection for prose and poetry suitable for children from kindergarten through grade six; methods and practice in storytelling.

117. Teaching Modern Mathematics in Elementary Schools (2) (Former Ed 107)

Admission to credential program. Points of view, curriculum, instructional materials and procedures in teaching modern mathematics in elementary school.

120. Problems in Elementary Education (1-3; max see below)

May be repeated with different topics. Prerequisite: E Ed 131, 132A (or concurrent); permission of instructor. Problems of classroom organization and management, culturally disadvantaged, developing curriculum materials, early childhood education, language arts, non-English speaking children, nursery school, reading, social studies, test construction.

121. Childhood Education (3) (Former Ed 175)

Prerequisite: E Ed 105. Development of young children; methods of teaching in kindergarten and primary grades; unification of nursery school, kindergarten, and primary grades.

122. Outdoor Education (2) (Former Ed 122)

Prerequisite: E Ed 105 or S Ed 152, Biol 157. Philosophy of outdoor education; operation of school programs in outdoor education, school camping, and conservation education. At least one weekend at an outdoor school site.

122F. Field Work in Outdoor Education (1-2; max total 2) (Former Ed 122F)

Prerequisite: E Ed 105 or S Ed 152, Biol 157; 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) (Former Ed 106)

Does not duplicate and may not substitute for E Ed 131. For teachers in service, primarily provisionally credentialed teachers. Directed observation to accompany theory classes.

131. Observation and Participation (1-4) (Former Ed 131)

Prerequisite: admission to credential program. Directed exercises in observation and participation to prepare for teaching, develop traits and qualities which make for success in teaching, and provide basic experiences for interpreting theories developed in parallel education courses.

132A. Student Teaching in Elementary Schools (3) (Former Ed 132)

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) (Former Ed 132)

Prerequisite: E Ed 132A or equivalent; one semester residence; admission to credential program. Directed teaching, participation, and teaching in public schools under supervision. Weekly conference with college supervisor.

133. Curriculum of the Elementary School (2) (Former Ed 153)

Does not duplicate and may not substitute for E Ed 250. Primarily for in-service teachers. Principles, backgrounds, and organization of curriculums; scope, grade placement, selection, and teaching of subject matter.

135. Audio-Visual Education (2) (Former Ed 109) (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) (Former Ed 137) (See Drama 137)**146. In-Service Child Study (1-2; max total 4) (Former Ed 186)**

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.

157. Conservation of Natural Resources (3) (Former Ed 157) (See Biol 157)**158. Speech for the Classroom Teacher (3) (Former Ed 158) (See Spch 158)****167. Teaching Internship (3-12)**

Prerequisite: Baccalaureate degree, approval of departmental admissions and internship committees, E Ed 132A, 168 (concurrent). One-half day teaching under contract for one school year under supervision of assigned college and district personnel.

168. Seminar for Interns (2-4; max total 4)

Prerequisite: E Ed 167 (concurrent). Curricular and instructional problems and procedures in elementary schools, with emphasis on internship assignment.

180. Modern Trends in Education (1-4; max total 4) (Former Ed 176) (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) (Former Ed 179) (Same as S Ed 185)

Prerequisite: E Ed 133 or S Ed 156; E Ed 105, 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) (Former Ed 190)

(See *Regulations and Procedures—Independent Study.*)

GRADUATE COURSES

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

212. Diagnosis and Correction of Reading Disabilities (3)

Prerequisite: E Ed 112 and graduate standing; Psych 111 recommended. Causes of reading disabilities; observation and interview procedures; diagnostic instruments; standard and informal tests; materials and methods of instruction.

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 (2) (Former Ed 220) (See A Ed 220)**250. Elementary School Curriculum Development (3) (Former Ed 250)**

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.

275. Workshop in Curriculum Development (1-6; max total 6) (Former Ed 278) (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) (Former Ed 283)

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) (Former Ed 290)

See *Regulations and Procedures—Independent Study*.

298. Seminar in Elementary Teaching (4) (Former Ed 298)

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 (2-4; max total 4) (Former Ed 299)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

353. Curriculum Problems and Practices (1-3; max total 12 if no topic repeated)**381. Planning and Organizing Outdoor Education (2) (Former Ed 380)****383. Problems in Child Study (2; max total 12) (Former Ed 383)****395. Supervision of Student Teachers (2; max total 4) (Former Ed 382) (See S Ed 395)**

SECONDARY EDUCATION DEPARTMENT

Professors: Ballou, Bigge, Brown, Hunt, Murphy
 Associate Professors: Gilbert, Roth
 Assistant Professors: Swineford (Chairman), Hasson
 Lecturer: Schroer

Departmental Supervisors

Faculty members in the various subject matter departments in which teacher candidates complete majors or minors have been designated as departmental supervisors. They advise on credential matters, teach methods courses in their subject fields, and supervise student teachers.

Department

Agriculture: Ball
 Art: Kusel
 Biology: D. Falk
 Business: H. Rohrer
 Chemistry: Vavoulis
 English: Billings, Karr, R. O'Neil
 Foreign Language: Pella, Poythress,
 Tucker
 Geography: A. Johnson
 Health Science: Fricker
 Home Economics: Kuehn
 Industrial Arts and Technology:
 Bliss, Dettinger

Department

Journalism: Duke
 Mathematics: Alkire
 Music: Bakkegard
 Nursing: Gardner
 Physical Education—Men: H. Beatty
 Physical Education—Women: Hupp-
 rich
 Physics: Shockley
 Psychology: Lindquist
 Social Science: Echols
 Speech: Stephens

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.

COOPERATING PUBLIC SCHOOL DISTRICTS

The professional preparation program of the Secondary Education Department utilizes 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 department works closely with the public schools in planning and implementing credential programs. A School and College Secondary Liaison Committee has been established to serve this purpose.

The following school districts are currently cooperating in the college program of secondary education:

Central Union High School
 Clovis Unified Schools
 Fresno City Unified Schools
 Reedley Joint Union High School

State Center Junior College
 Tulare Union High School
 Visalia Union High School

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 State Department of Education.

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, including the English and the competency requirements in composition described in paragraph 1 below 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. Three semesters of English, including a course in composition, must be completed. Service courses of a remedial nature will not meet this requirement.
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. The fifteen-unit concentration constitutes a single subject major for the purpose of satisfying credential requirements. Interdepartmental majors may be offered in the following subject matter areas:

- a. Physical Sciences
- b. Social Sciences
- c. Humanities
- d. Any 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 with Specialization in Secondary Teaching includes at least one course in each of 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.

	<i>Units</i>
S Ed 151, 152, 153.....	9
S Ed 161 or equivalent (see below).....	2
S Ed 166 (in major and in minor, if required).....	6

17

Recommended Electives: S Ed 135, 164, A Ed 154, 174.

Equivalent Departmental Methods Courses: Ag 186, Art 104, Bus 281, H Ec 140, IA 192, Jour 131, PE 161.

Internship

An internship which permits the student to teach on a half-time salaried basis while he is completing the 30 units of postgraduate work required for the credential may be arranged for superior students in the secondary teaching credential program. Plans for entering the program should be made at the beginning of the senior year. Consult the chairman of the Secondary Education Department for details.

THE STANDARD TEACHING CREDENTIAL WITH SPECIALIZATION IN JUNIOR COLLEGE TEACHING

Candidates for the Standard Teaching Credential with Specialization in Junior College Teaching authorizing assignments primarily in grades 13 and 14, may complete recommended professional courses in the Secondary Education Department. The minimum requirements for the credential are included in the following statements:

General Education: The requirements are the same as those for the specialization in secondary teaching given above.

Major and Minor: A master's or higher degree granted by an approved institution in a single subject normally taught in the public schools is required. Either the major or the minor (or both) must be in an academic subject. For purposes of this requirement, each of the following, among other subjects, is considered to be a single subject:

- | | |
|-------------------------|-----------------------|
| a. Agricultural Science | f. Home Economics |
| b. Biological Sciences | g. Industrial Arts |
| c. Business | h. Journalism |
| d. Engineering | i. Law |
| e. Health Science | j. Physical Education |

A master's or higher degree granted by an approved institution on the basis of an interdepartmental graduate major may be used. Such a major must include twelve semester units of graduate work in a single subject. The twelve semester unit concentration constitutes a single subject major for the purpose of satisfying credential requirements.

The requirements in the minor are the same as those indicated for the specialization in secondary teaching. The minor may be taken in whole or in part before or after the baccalaureate or higher degree is conferred.

Professional Preparation for Junior College Specialization: The department recommends that the candidate complete S Ed 258 and additional courses selected from the secondary credential sequence. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

*Courses***SECONDARY EDUCATION (5 Ed)****110. General Methods of Teaching (2) (Former Ed 159) (Same as E Ed 110)**

Prerequisite: S Ed 152, or equivalent. Basic principles of teaching and application to the classroom; implications of methods for classroom management, motivation, pupil behavior, and reporting to parents; preparation of instructional plans and evaluation instruments.

135. Audio-Visual Education (2) (Former Ed 109) (See E Ed 135)**151. Cultural Foundations of Education (3) (Former Ed 127)**

Prerequisite: Soc 1A, Anthro 2, or permission of instructor; admission to credential program. Education in the United States, philosophical influences, socio-economic factors, educational developments and trends; professional bases of teaching; scope, function, and desirable outcome of public education; current educational issues.

152. Psychological Foundations of Education (3) (Former Ed 128)

Not open to students with credit in A Ed 105. Prerequisite: S Ed 151 or permission of instructor; 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) (Former Ed 129)

Not open to students with more than 3 units of credit in A Ed 154, S Ed 110, 135. 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.

156. Secondary Education (2) (Former Ed 173)

Prerequisite: S Ed 152 or permission of instructor. Development of secondary education in America; objectives, administrative characteristics, curricular and extracurricular features, articulation with other school divisions, types of students served, methods of instruction, guidance, community relationships.

161. Methods and Materials in Secondary Teaching (2-3) (Former Ed 160)

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.

163. Observation and Participation (1-4) (Former Ed 131)

Prerequisite: admission to credential program. Guided observation of public school services, programs, and procedures; a variable course that may include classroom participation. Scheduled separately and also in conjunction with S Ed courses.

164. 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 (1-9) (Former Ed 133)

Prerequisite: one semester residence; bachelor's degree; completion of major and minor 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 163, 168 (concurrent), completion of credential major. One-half day teaching under contract for one school year, 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.

180. Modern Trends in Education (1-4; max total 4) (Former Ed 176) (See E Ed 180)**184. History of Education in the United States (3) (Former Ed 148, A Ed 184)**

Prerequisite: teaching experience or permission of instructor. 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) (Former Ed 179)
(See E Ed 185)****186. Educational Sociology (2) (Former Ed 152, A Ed 186)**

Prerequisite: teaching experience or permission of instructor. 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.

187. Philosophy of Education (2) (Former Ed 172, A Ed 187)

Prerequisite: teaching experience or permission of instructor. Educational significance of present philosophical outlooks; educational, psychological, and sociological implications of major philosophies of education.

188. Issues in Educational Theory (2) (Former Ed 177, A Ed 188)

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) (Former Ed 190)

(See *Regulations and Procedures—Independent Study.*)

GRADUATE COURSES

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

220. Research in Education (2) (Former Ed 220) (See A Ed 220)**251. Secondary School Reading (2) (Former Ed 215)**

Prerequisite: S Ed 152, teaching experience or permission of instructor. Recommended: A Ed 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) (Former Ed 253)

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 Junior College (2) (Former Ed 273)

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.

275. Workshop in Curriculum Development (1-6; max total 6) (Former Ed 278)
(See E Ed 275)

280. Current Problems in Secondary Education (3) (Former Ed 283)

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.

290. Independent Study (1-3; max see reference) (Former Ed 290)

(See *Regulations and Procedures—Independent Study.*)

298. Seminar in Secondary Teaching (4) (Former Ed 298)

Prerequisite: advancement to candidacy for 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.

299. Thesis (2-4; max total 4) (Former Ed 299)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

IN-SERVICE COURSES

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

362. Adult Education (2; max total 4) (Former Ed 362)

363. Curriculum Problems and Practices (1-3; max total 6, if no topic repeated)

393F. Field Work in Curricula (1-3; max total 6, if no project repeated)

395. Supervision of Student Teachers (2; max total 4) (Former Ed 382) (Same as E Ed 395)

ADVANCED STUDIES DEPARTMENT

Professors: R. Evans, R. H. Harrison, Kremen (Pupil Personnel Services Coordinator), Wilcox (Chairman and Administration-Supervision Coordinator)

Associate Professors: Griffiths, Mach (Special Education Coordinator)

Assistant Professors: G. Johnson, Poole

Part-time: Perrott

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 master of arts degree in education with concentrations in administration and supervision, counseling and guidance, educational theory, and 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 permits service as a supervisor, consultant, coordinator (or other intermediate administrative position), and principal, when specifically authorized. The level at which a holder of this credential may serve in the capacities indicated above is determined by the level of the teaching credential held. See department chairman for requirements for admission to the credential program.

REQUIREMENTS

The minimum requirements for the Standard Supervision Credential are as follows:

1. Six years of college or university education in an approved institution, including two years of acceptable postgraduate work.
2. A master's degree or other postgraduate degree requiring not less than five years of college or university work, or in lieu of the degree, the certification by an approved institution that the completed graduate work is the equivalent of a master's degree. If the master's degree or the certificate of equivalency is not based on an academic subject matter area, the postgraduate work must include twelve semester units of work in academic subject matter.
3. The possession of a valid basic teaching credential.
4. Five years of successful full-time teaching experience in public elementary schools, secondary schools, or private schools of equivalent status.

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 Ed 261, 264, 266
2. Personnel administration: A Ed 262

3. Development and evaluation of instructional programs: A Ed 263
4. Work related to specialized functions, including services as a principal or supervisor; appropriate courses from the following in consultation with the adviser: A Ed 154, 286, 287, 174 or 224, 225, 226, 240, 241, 242, E Ed 250 or S Ed 253
5. Supervised field experiences: A Ed 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 6554*.

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 all of the following:

1. Seven years of college or university education, or its equivalent in an approved institution, including three years of acceptable postgraduate education.
2. A master's degree in an academic subject matter area or, in lieu of the degree, certification by an approved institution that does not grant a master's degree in the applicant's subject matter major to the effect that work equivalent to the master's degree has been completed.
3. The possession of a valid Standard Teaching Credential or a valid General Teaching Credential other than a credential issued on partial fulfillment of requirements or postponement of requirements and other than a provisional, limited, or exchange credential.
4. A minimum of five years of successful full-time classroom teaching experience in public elementary or secondary schools, or in private schools of equivalent status.

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 Ed 264, 266
2. School management: A Ed 267, 270, 271
3. Education and school administration in the community: A Ed 286
4. Staff development and advanced techniques of personnel management: A Ed 275
5. Curriculum development, evaluation and research: E Ed 250 or S Ed 253
6. Supervised field work experiences: A Ed 268
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 6561*.

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: Child Welfare and Attendance; Pupil Counseling and Psychometry and Psychology. 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 consult the Coordinator of the Pupil Personnel Services Credential Program as early as possible and be admitted to the credential program.

REQUIREMENTS

In general, the basic requirements for the Standard Designated Services Credential with a Specialization in Pupil Personnel Services are described below.

1. A master's or higher degree from an approved institution. The master's degree must be in counseling, psychology, social work, rehabilitation counseling, or an academic subject matter area, depending upon the specialty the student wishes to have designated on his credential.

2. Sixty semester hours of postgraduate work of upper division or graduate level in the area of pupil personnel services taken in an approved institution. The master's degree program may be included within the required sixty semester units, provided all of the requirements can be met.

3. Applicants who have completed three years of successful full-time teaching experience may substitute for one-half of the required sixty semester units of course work in pupil personnel services, thirty semester units in other areas. This does not relieve the applicant of the sixty-unit requirement. It does, however, enable the experienced teacher to substitute thirty units of postgraduate work in other fields for one-half of the sixty-unit requirement in courses directly related to the pupil personnel services. In the event that an applicant elects to make such a substitution, only the Child Welfare and Attendance and Pupil Counseling designations will appear on the credential.

4. Applicants seeking Psychometrist and Psychologist designations may not make the substitution indicated under paragraph 3 above. Those who desire these designations must secure verification of their competency to administer psychological examinations and to recommend placement based upon the use of individual psychological examinations. Such institutional verifications are based on the completion of specific course work in psychology and psychological testing.

5. Candidates for the Standard Designated Services Credential with Specialization in Pupil Personnel Services must also complete appropriate supervised field experiences. This may be accomplished either by the completion of an approved pupil services internship, or by the completion of 480 clock hours of supervised field experience, at least half of which must be in a school serving students between the ages of 4 and 21 years of age. Successful work experience may be substituted for 480 clock hours of supervised field experience at the rate of one-half of the requirement for each one year of full-time counseling experience and/or three years of full-time teaching experience.

PROFESSIONAL PREPARATION

Candidates for the standard credential authorizing the various designated pupil personnel services must complete, as part of the total requirements for the credential, specific course work in the areas listed below:

1. Pupil personnel services, concept and procedures
2. Counseling theory and procedures
3. Dynamics of individual behavior
4. Measurement theory and procedures

5. Group processes, theory and procedures
6. Educational and career planning
7. Research methodology
8. Remedial and special education
9. Laws relating to children
10. Organization of pupil personnel services

For more specific information regarding the program leading to the Standard Designated Services Credential with Specialization in Pupil Personnel Services, the student should consult the Coordinator of the Pupil Personnel Services Program, at the earliest possible date prior to beginning work on the credential.

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 the required minor in each of the programs leading to the Standard Teaching Credential with Specializations in Elementary Teaching, Secondary Teaching, and Junior College Teaching. Students wishing to make the substitution with specialized preparation in the area of the mentally retarded or in the area of the speech and hearing handicapped should consult the Coordinator of Special Education not later than the second semester of the sophomore year. Students electing to substitute specialized preparation for the minor must select a major in an academic subject matter area.

AREA OF MENTALLY RETARDED

The course work for specialized preparation in the area of the mentally retarded includes the following 26-28 semester units and 4 units in student teaching:

	<i>Units</i>
Psych 167, 168	6
A Ed 160, 161, 162	9
Sp Corr 150, Art 135	6
Elect from: A Ed 115F, Sp Corr 151, 152	1-3
	22-24
A Ed 163A	4
	26-28

AREA OF SPEECH AND HEARING HANDICAPPED

The course work for specialized preparation in the area of speech and hearing handicapped includes the following 39 units and 10 units in clinical practice and student teaching:

Psych 168, A Ed 160	6
Sp Corr 150, 151, 152, 153, 154, 156, 157, 162, 163, 164	30
Approved electives	3
	39
Professional Requirements: Sp Corr 255 (4 un), A Ed 164 (4 un), elect (2 un)	10
	49

(Recommended: Psychology minor for speech correction and audiology)

For additional information consult the speech correction adviser in the *Speech Arts Department*.

MASTER OF ARTS DEGREE

The Advanced Studies Department offers the master of arts degree in education with concentrations in administration and supervision, counseling and guidance, educational theory, and special education. Students may combine their programs of study so that courses may be applied on both the master of arts degree and the desired advanced credential program. The master of arts degree in education with a concentration in educational theory is available for students who may already hold an advanced credential or who do not wish to relate their study for an advanced degree to a particular credential.

For specific requirements for the master of arts degree consult the department chairman; 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. Students must also comply with policies and procedures established by the School of Education Graduate Committee.

*Courses***ADVANCED STUDIES (A Ed)**

Note: Courses are offered in the following areas:

Educational Foundations: A Ed 153, 154, 285, 286, 287

Counseling and Guidance: A Ed 172, 174, 175, 176, 177, 179, 218, 224, 224F, 225, 226, 255

School Administration and Supervision: A Ed 261, 262, 263, 264, 266, 267, 268, 269, 270, 271, 275

Special Education: A Ed 115F, 160, 161, 162, 163A, 163B, 164, 165, 167, 240, 241, 242, 243

All areas: A Ed 190, 200, 290, 298, 299

112. School Public Relations (2) (Former Ed 112) (See Jour 112)**115F. Field Work With Exceptional Children (1; max total 3) (Former Ed 115F)**

Prerequisite: Psych 168. Direct work with exceptional children; supervised experiences in guidance and counseling of exceptional children in special classes and in community facilities.

143. Radio and Television in Education (2) (Former Ed 143) (See R-TV 143)**143L. Radio and Television Education Laboratory (1) (Former Ed 143L)
(See R-TV 143L)****150. Introduction to Speech Correction (3) (Former Ed 150) (See Sp Corr 150)****151. Principles of Aural Rehabilitation (3) (See Sp Corr 163)****153. Elementary Statistics (3) (Former Ed 125)**

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) (Former Ed 126)

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 and Guidance of Exceptional Children (3) (Former Ed 114)

Prerequisite: Psych 168. Historical development, status and trends in education, and legal provisions for atypical children; guidance of the handicapped. (2 lecture, 2 supervised field hours)

161. Training of the Severely Retarded Child (3)

Prerequisite: Psych 167, 168, A Ed 160. Sensory development and training, growth and developmental processes of the severely mentally retarded child; techniques of working with parents. Includes observation and participation. (2 lecture, 2 supervised field hours)

162. Curriculum and Methods: Mentally Retarded and Slow Learner (3)
(Former Ed 166)

Methods of instructing the mentally retarded child and slow learner; examination and demonstration of materials. (2 lecture, 2 field hours arranged)

163A. Student Teaching, Exceptional Children: Mentally Retarded (1-4)
(Former Ed 135, A Ed 163)

Prerequisite: completion of student teaching requirement for a standard teaching credential; one semester residence; admission to the credential program. 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 (1-4)
(Former Ed 135, A Ed 163)

Prerequisite: completion of student teaching requirement for standard credential; one semester residence; admission to credential program. Directed observation, participation and teaching in classes for the educationally handicapped in public schools under supervision. Weekly conference with college supervisor.

164. Student Teaching: Speech Correction and Lip Reading (1-4) (Former Ed 134)

Prerequisite: 4 units of Sp Corr 155; completion of student teaching requirement for a basic teaching credential; one semester residence; admission to the credential program. Directed observation, participation, and teaching in classes for speech correction and lip reading in public schools under supervision. Weekly conference with college supervisor.

165. Methods in Special Education (1-4; max total 4) (Former Ed 165)

Prerequisite: E Ed 105 or S Ed 152 or Psych 168; teaching experience or permission of instructor. Materials and methods for teaching the learning deviates commonly found in regular classrooms, especially the rapid and slow learners; case studies.

167. Education of the Emotionally Disturbed (2) (Former Ed 167)

Prerequisite: E Ed 105 or S Ed 152 or Psych 168. Materials and methods for teaching emotionally disturbed children commonly found in regular classrooms; case studies, referral procedures, and working with parents.

172. Laws Relating to Children (2) (Former Ed 164)

May not substitute for A Ed 264. The *Education Code*, *Labor Code*, and *Welfare Code* of the State of California; federal legislation applicable to children.

174. Principles and Techniques in Guidance (3) (Former Ed 174) (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.

175. Occupational Analysis and Information (2) (Former Ed 155)

Prerequisite: A Ed 174. Theories of occupational choice and their importance for counseling; sources of guidance information; community surveys; job analysis; follow-up studies, work experience programs; placement programs.

176. Child Welfare, Parent Education, and Counseling (2) (Former Ed 180)

Techniques, procedures, and materials for teacher use in facilitating effective home-school relationships.

177. Testing in Counseling (3)

Prerequisite: A Ed 153, 175. Administration and interpretation of commonly used tests in counseling; preparation of case reports.

179. Group Process in Pupil Personnel Services (3)

Prerequisite: A Ed 174, 175. Group process theory and procedures in pupil personnel services; use of groups in the school guidance program. Meets requirement of the designated services credential.

190. Independent Study (1-3; max see reference) (Former Ed 190)

(See *Regulations and Procedures—Independent Study.*)

GRADUATE COURSES

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

218. Mental Hygiene and Guidance of Children (3) (Former Ed 218) (Same as Psych 218)

Prerequisite: E Ed 105. Seminar on emotional and social problems of children in their adjustments to school and home practices and pressures; critical evaluation of tests, tools, techniques, and procedures in guidance practices for parents and teachers. (2 lecture, 2 field hours arranged)

220. Research in Education (2) (Former Ed 220) (Same as E Ed-5 Ed-PE 220)

Prerequisite: graduate standing and 15 units of education including A Ed 153 or equivalent. Seminar in research methodology; identification of educational research problems; use of library resources, data gathering and processing, writing a research report.

224. Counseling Techniques (3) (Former Ed 224) (See Psych 224)**224F. Field Work in Counseling (2-12) (Former Ed 224F) (See Psych 224F)****225. Advanced Theories and Techniques in Counseling (3)**

Prerequisite: A Ed 175, 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) (Former Ed 202)

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 Ed 175, 224. Organization, administration, and evaluation of guidance services.

240. Diagnostic Testing and Remedial Teaching (3) (Former Ed 208)

Prerequisite: E Ed 105, 154. Tools and procedures in diagnostic and remedial programs in arithmetic, reading, language, spelling, handwriting, health, and social studies. (2 lecture, 2 field hours arranged)

241. Classroom Practice in Diagnostic Testing and Remedial Teaching (3) (Former Ed 210)

Prerequisite: A Ed 240. Work with individual pupils and small groups in diagnosing learning difficulties and providing remedial work. (2 lecture, 2 field hours arranged)

242. Education and Guidance of the Gifted and Creative (3) (Former Ed 212)

Prerequisite: E Ed 105 or equivalent; teaching experience. Nature and needs of the gifted and creative; program planning; field work. (2 lecture hours; 2 field-study hours arranged)

243. Seminar in the Education of the Neurologically Handicapped Child (3)

Prerequisite: teaching experience. Characteristics of the neurologically handicapped child; methods of instruction; administrative and guidance problems; case studies.

255. Individual Mental Testing (3) (Former Ed 255) (See Psych 265)**261. Organization for Administration and Support of Education (3) (Former Ed 261)**

Prerequisite: teaching experience. Interrelationships of federal, state, county, city, and district units in the administration and promotion of programs of education.

262. School Principalship (3) (Former Ed 262)

Prerequisite: teaching experience; A Ed 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. Supervision for Improvement of Instruction (3) (Former Ed 263)

Prerequisite: teaching experience; E Ed 250 or S Ed 253; A Ed 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. Legal Aspects of Education (3) (Former Ed 264)

Prerequisite: teaching experience; A Ed 261 or equivalent. Legal provisions governing public education, with special attention to the *California Education Code*.

266. School Finance and Business Administration (3) (Former Ed 266)

Prerequisite: A Ed 261 or equivalent. Principles and practices of school finance and business administration; local, state, and federal responsibility for financial support of education.

267. School-Community Relations and School Housing (2) (Former Ed 267)

Prerequisite: A Ed 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) (Former Ed 268)

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) (Former Ed 269)

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. School Business Administration I (3) (Former Ed 270)

Prerequisite: A Ed 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. School Business Administration II (3) (Former Ed 271)

Prerequisite: A Ed 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.

275. Advanced Techniques of Personnel Administration in Education (3)

Prerequisite: A Ed 262, 264, 266, Bus Ad 151, 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 responsibility of nonteaching staff members.

280. Advanced Problems in Education (3) (Former Ed 283)

Prerequisite: possession of a regular teaching credential or permission of instructor. Problems of teaching and administration of the public school; recent reports of national professional groups; newly developed research; significant movements in education.

285. Advanced Educational Psychology (3) (Former Ed 285)

Prerequisite: E Ed 105. Seminar on the psychological foundations of education; nature and characteristics of development, learning process, forces which affect educational growth.

286. Advanced Educational Sociology (3) (Former Ed 286)

Prerequisite: A Ed 186; 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. History of Educational Thought (3) (Former Ed 287)

Prerequisite: A Ed 187; 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) (Former Ed 290)

See *Regulations and Procedures—Independent Study*.

298. Seminar in Advanced Studies (4) (Former Ed 298)

Prerequisite: advancement to candidacy for MA degree; B average on 24 units of MA program including A Ed 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, weekly group discussions, weekly individual conferences, and hours arranged.

299. Thesis (2-4; max total 4) (Former Ed 299)

Prerequisite: see *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis for the master's degree.

SCHOOL OF ENGINEERING

Engineering 270

Agricultural
Civil
Electrical and Electronics
Industrial
Mechanical

SCHOOL OF ENGINEERING

Thomas H. Evans, Dean

Professors: T. Evans, Barnhart, Cehrs, Foin, J. H. Smith

Associate Professors: Deming, Gaylord, Higgins, Jarrett, Kulhan, Richards

Assistant Professors: Bevill, Dominick, Liao

Part-time: Grote, Regier, J. Taylor

The School of Engineering provides instruction in the fields of agricultural, civil, electrical and electronics, industrial, and mechanical engineering.

The training includes experience in solving typical problems involving analysis and design. The theoretical studies are supported by laboratory work which demonstrates the theory and also gives the student a familiarity with instruments and equipment with which professional engineers frequently deal.

The course work in engineering requires as a prerequisite a basic knowledge of mathematics and the physical sciences which, together with the general education program, give the student a broad education.

The School of Engineering is accredited by the Engineers' Council for Professional Development.

The School of Engineering offers bachelor of science degree majors in agricultural, civil, electrical and electronics, industrial, and mechanical engineering. Students are prepared for professional engineering and graduate study. A substantial amount of science and mathematics is required in the undergraduate program in order that the student understand thoroughly the science he must apply as a professional engineer. The program is science oriented, but only for the purpose of providing the understanding necessary for engineering analysis and creative design. Projects in engineering design that integrate and apply previous fundamental knowledge are assigned in the senior year.

The undergraduate program for the degree is designed to meet national accrediting requirements by containing approximately one-fourth of the program in each of the following areas: basic science and mathematics; engineering science (such as mechanics of solids and fluids, materials, thermodynamics, electricity and magnetism); analysis, design, and support subjects in a professional major (such as civil, electrical, or mechanical); humanities, social sciences, electives and auxiliary subjects.

HIGH SCHOOL PREPARATION

Minimum high school preparation for entering the engineering program consists of the following: English (3 years), algebra (2 years), geometry (1 year), advanced mathematics (or trigonometry or elementary functions) ($\frac{1}{2}$ year), physics or chemistry (1 year). Deficiencies in the minimum high school requirements can be made up at the college in regular or summer sessions, but may extend the program beyond the normal four years.

Additional recommended high school courses include: advanced mathematics ($\frac{1}{2}$ year), physics or chemistry (1 year), biology (1 year), foreign language (2 years), history (1 year), mechanical drawing ($\frac{1}{2}$ year), shop ($\frac{1}{2}$ year).

TRANSFERS

Transfers from junior colleges or other institutions of higher learning are accepted under provisions outlined under *Regulations and Procedures—Admissions*. Students planning to transfer to the Fresno State College engineering program should follow as closely as possible the programs outlined below. Significant deviation from the program in mathematics, science, and engineering courses may necessitate more than the normal four years to complete the engineering degree requirements.

ENGINEERING FIELDS *are utilized*

In **Agricultural Engineering.** Agricultural engineering utilizes basic fundamentals of engineering and agriculture in the economic applications of scientific knowledge to agricultural production and processing; specifically, to the development of machinery, structures, equipment, practices, techniques, methods, and fundamentals. Agricultural engineering prepares *all types* for positions in the equipment industry in the areas of design, research, development, testing, sales and management; in the irrigation and drainage field for both public and private organizations, in the areas of design, field investigation, project planning, operation, maintenance, construction supervision and management.

Civil Engineering. Among the many areas included in civil engineering are design and construction of bridges, buildings, dams, waterways, railroads, airport terminals, pipelines, highways, water supply and sanitary systems, foundations, hydroelectric installations, irrigation, and many other systems and structures of modern civilization. Also included are design and structure of airplanes and missiles and the field of surveying and mapping.

Electrical and Electronics Engineering. Electrical engineering's many specialties are grouped under the two main areas of power and electronics. Power engineering involves the generation, distribution, and utilization of electricity to provide power, heat, and light, and *is made* use of various electronic devices in the process. Electronics engineering involves electrical communications, including electron devices for transmission and reception over wires or through space; devices which control or aid industrial processes, medical science, guidance and detection of air and spacecraft; and exceedingly high-speed electronic computing machines.

Industrial Engineering. Industrial engineering is the field of engineering developed to consider the economic and human, as well as technical, aspects of engineering endeavor, especially in the area of industrial production activities. This field of engineering has application in all types of industry and in areas requiring efficient use of manpower, machines, materials, and money.

Mechanical Engineering. Mechanical engineering is the branch of engineering involving generation, transmission, and utilization of thermal, nuclear, or mechanical energy, including refrigeration and air conditioning. It deals with engineering problems involving machinery and systems, their control and products, and involves research, design, production, operational, organizational, and economic aspects of the field.

CREDENTIAL PROGRAM

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

BACHELOR OF SCIENCE DEGREE IN ENGINEERING

The bachelor of science degree in engineering is granted upon completion of 136 units in all engineering majors except mechanical engineering which requires 128 units. The general degree requirements and general education requirements must be met. See requirements listed below and under *Degrees and Credentials*. General education requirements throughout the program may be taken in any order approved by the adviser. The sequences listed below require 17 units per semester (16 in mechanical engineering). A major in one of the fields of engineering consists of all engineering courses, including approved electives, listed below in the program for the first two years required of all engineering students, and in one of the specific fields of concentration. The major in agricultural engineering includes, also, listed courses in agriculture; and the industrial engineering major includes listed courses in business and economics.

First and Second Year Programs Required of All Engineering Majors

- 1st Year: 1st Semester: Engr 26, Math 75, Chem 1A, PE or AFROTC, Arts (except ME)
 2nd Semester: Math 76, Chem 8, Physics 4A, English 1, HSc 91, PE or AFROTC
- 2nd Year: 3rd Semester: Math 77, Physics 4B, Speech, Hist 11 or 12, Engr 30, 70 (except ME), PE or AFROTC
 4th Semester: Math 81, Physics 4C, Pol Sc 11, Arts (0-1 un), PE or AFROTC, Engr 32; for CE and AgE (Engr 1, 1L), for ME and IE (Engr 11, 11L), for EE (Engr 150, 150L)

Third and Fourth Year Programs for Specific Majors**Agricultural Engineering (AgE)**

- 3rd Year: 5th Semester: Engr 130, 131, 131L, 164, 164L, Ag 136, AH 1
 6th Semester: Engr 11, 11L, 121, 165, 165L, AgM 115, Bot 1
- 4th Year: 7th Semester: Psych 10, Engr 150, 150L; social science; approved electives; elective
 8th Semester: Engr 151, 151L, 170, AgM 81, 159, literature or philosophy; approved elective
 (Approved electives from: Ag 146, 184, AgM 116, 151A-B, 158, Geology, Engr 141)

Civil Engineering (CE)

- 3rd Year: 5th Semester: Engr 2, 2L, 130, 131, 131L, 164, 164L, Psych 10
 6th Semester: Engr 135, 137, 138, 165, 165L, literature or philosophy; approved electives
- 4th Year: 7th Semester: Engr 134, 143, 150, 150L, 170; social science; approved electives
 8th Semester: Engr 133, 142, 151, 151L or 156, 156L; 172; biological science; elective
 (Approved electives from: Engr 101, 102, 103, 104, 139, 141, 144, 145, 171, 173, Geology)

Electrical and Electronics Engineering (EE)

- 3rd Year: 5th Semester: Engr 130, 131, 152, 152L, 155, 155L, 156, 156L
 6th Semester: Engr 131L, 151, 151L, 153, 153L, 157, 157L, 164, 164L
- 4th Year: 7th Semester: Engr 165, 165L, biological science, literature or philosophy; approved elective; elective
 8th Semester: Engr 170, 172, Psych 10, history, arts; approved elective
 (Approved electives from: Engr 158, 158L, 171, 173, 180, 180L, 181, 181L)

Industrial Engineering (IE)

- 3rd Year: 5th Semester: Engr 130, 131, 131L, 164, 164L, Bus Ad 124, Econ 1A
 6th Semester: Engr 110, 121, 150, 150L, 165, 165L, Econ 1B
- 4th Year: 7th Semester: Engr 111, 151, 151L, 170, Acct 1A, Psych 10; approved elective
 8th Semester: Engr 156, 156L, 172, biological science, literature or philosophy, social science; approved elective
 (Approved electives from: Acct 1B, Bus Ad 151, 161, Engr 122, 139, 171, 173, Math 51 or 131)

Mechanical Engineering (ME)

- 3rd Year: 5th Semester: Engr 70, 130, 131, 164, 164L, Psych 10, Arts
 6th Semester: Engr 121, 150, 150L, 165, 165L, literature or philosophy
- 4th Year: 7th Semester: Engr 122, 131L, 151, 151L, 166, 166L, Arts; approved elective
 8th Semester: Engr 170, 172, biological science; social science; approved elective; elective
 (Approved electives from: Engr 123, 124, 136, 139, 145, 156, 156L, 162, 162L, 171, 173, 181, 181L)

Courses**ENGINEERING**

Note: Associated lecture and laboratory courses must be taken concurrently except as indicated in course sequences.

1. Plane Surveying: Elementary (2)

Prerequisite: Math 29, 30, one year of mechanical drawing, or permission of instructor. Familiarization with surveying instruments; calculations; topographic surveying.

1L. Plane Surveying: Elementary Laboratory (1)

Field practice in measurements of distance, and in use of level, transit, and plane table in solution of practical problems. (3 lab hours; field trips)

2. Plane Surveying: Advanced (2)

Prerequisite: Engr 1, 1L. Theory and computations covering land surveying; engineering astronomy; introduction to route surveying.

2L. Plane Surveying: Advanced Laboratory (1)

Field practice in land surveying, astronomy, triangulation, and route layout. (3 lab hours; field trips)

11. Manufacturing Processes (2)

General purpose and production machine tools, metal cutting and welding, hot and cold forming, grinding, gages, jigs, fixtures, tooling.

11L. Manufacturing Processes Laboratory (1)

Operation of machine tools, welding equipment, hot and cold forming equipment, casting equipment; practice in the use of gages, jigs, and fixtures. (3 lab hours; field trips)

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)

30. Engineering Mechanics: Statics (2)

Prerequisite: Physics 4A; Math 77 (or concurrently). Statics, analysis of force systems, equilibrium problems, graphic and algebraic methods of problem solution.

32. Engineering Materials (2)

Prerequisite or concurrently: Engr 30, Chem 8. Fundamental nature and properties of engineering materials; structure of matter; mechanical, electrical, magnetic, and thermal properties.

70. Computer Programming (1)

Prerequisite: Math 75, 76. Introduction to digital computer programming. (1 2-hour lecture-lab)

101. Route Surveying (2)

Prerequisite: Engr 2, 2L. Computation and field work covering surveys for highway, irrigation, construction and other kinds of engineering projects. (1 lecture, 3 lab hours; field trips)

102. Geodetic Surveying (2)

Prerequisite: Engr 2, 2L; Math 76. Triangulation; adjustment of geodetic figures; base line measurement, map projection; precise leveling. (1 lecture, 3 lab hours; field trips)

103. Photogrammetry (2)

Prerequisite: Math 30, Engr 1, or permission of instructor. Terrestrial and aerial photography applied to surveying and mapping; stereoscopy; application of aerial surveying to specific engineering problems. (1 lecture, 3 lab hours; field trips)

104. Boundary Control and Legal Principles (2)

Prerequisite: Engr 2. Legal principles that control the boundary location of real property.

110. Statistical Analysis and Control (3)

Prerequisite: Math 76. Fundamentals of probability and statistics; general theory and practice of statistical quality control applied to industrial situations; sampling plans; introduction to statistical methods used in industrial research.

111. Methods Analysis (2)

Prerequisite: Senior standing in engineering, or permission of instructor. General approach to a design problem; application of the design approach to methods engineering; principles of motion economy; descriptive techniques useful to the methods designer; work measurement; work sampling; special problems in methods engineering. (2 2-hour lecture-labs)

121. Mechanism (3)

Prerequisite: Engr 26, 130. Analytical and graphical solutions of motion problems involving mechanical elements; synthesis of plane and space linkage systems. (2 3-hour lecture-labs)

122. Machine Design (3)

Prerequisite: Engr 70, 130, 131; Math 81. Analytical study of machinery; applications to design of machines; use of computers in design problems.

123. Advanced Mechanical Design (2)

Prerequisite: Engr 121, 122. Analytical study of dynamics of machinery; applications to design problems. (2 2-hour lecture-labs)

124. Mechanical Vibration (3)

Prerequisite: Engr 130; 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.

130. Engineering Mechanics: Dynamics (3)

Prerequisite: Engr 30. Application of principles of kinematics and kinetics to problems in engineering.

131. Mechanics of Materials (3)

Prerequisite: Engr 30. Application of principles of mechanics to find stresses and deformations in machine and structural members.

131L. Mechanics of Materials Laboratory (1) (Former Engr 132)

Prerequisite: Engr 32; 131 (or concurrently). Application of the principles and methods of testing to verify theory and determine limitations of principles of mechanics of materials. (3 lab hours)

133. Steel and Timber Structures (3)

Prerequisite: Engr 135. 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. Reinforced Concrete (3)

Prerequisite: Engr 135. Design and investigation of concrete structures by elastic and ultimate design procedures; prestressed concrete. (2 lecture, 3 lab hours)

135. Theory of Structures (3)

Prerequisite: Engr 131. Trusses and frames analyzed by algebraic and graphic procedures; influence lines and Cooper diagrams; rigid frames analyzed by slope deflection and moment distribution.

136. Physical Metallurgy (2)

Prerequisite: Engr 131L. Physical properties of metals as manufactured and affected by heat-treatment and forming processes; correlation of properties with microstructure. (1 lecture, 3 lab hours)

137. Soil Mechanics (3)

Prerequisite: Engr 131L. Physical and mechanical properties of soil as an engineering material; theoretical studies in permeability, compressibility and compression and stress-deformation and strength characteristics. (2 lecture, 3 lab hours; field trips)

138. Highway Engineering (2)

Prerequisite: Engr 2; 137 (or concurrently). Feasibility and economic considerations in location, design, construction, and maintenance of streets and highways.

139. Advanced Mechanics of Materials (3)

Prerequisite: Engr 70, 131; Math 81. Advanced topics in mechanics of materials.

141. Irrigation Engineering (2)

Prerequisite: Engr 131, 164. Flow of water in canals, design of canals and canal systems, measurements of water, surveys for irrigation systems. (1 lecture, 3 lab hours; field trips)

142. Water Supply and Sanitation (2)

Prerequisite: Engr 164. Water treatment plants, distribution systems, waste collection systems and disposal facilities; storm drainage systems. (2 lecture; field trips)

143. Concrete Laboratory (1)

Prerequisite: Engr 131L; 134 (or concurrently). Proportioning of concrete mixes; admixtures; test for entrained air; slump test; compressive and flexural strength tests; reinforced concrete. (3 lab hours; field trip)

144. Foundation Design (3)

Prerequisite: Engr 137, 134 (or concurrently). Theory and design of footings, piles, retaining walls, and other structures combining the use of soil mechanics and structural analysis.

145. Fluid Dynamics (3)

Prerequisite: Engr 70, 165, Math 81. Stream function, velocity potential function, conformal transformation with applications to engineering problems.

150. Magnetic and Electric Circuits (3)

Prerequisite: Physics 4B, Math 77 (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.

150L. Magnetic and Electric Circuits Laboratory (1)

Use of electrical instruments; experiments and computations on magnetic, direct- and alternating-current circuits, single and polyphase, and on transient phenomena in simple circuits. (3 lab hours)

151. Electrical Machinery (3)

Prerequisite: Engr 150, 150L. Principles of direct- and alternating-current machinery and of other energy-conversion devices and associated apparatus.

151L. Electrical Machinery Laboratory (1)

Experiments and computations on direct- and alternating-current machinery and on other energy-conversion devices and associated apparatus. (3 lab hours)

152. Electrical Circuit Analysis (3)

Prerequisite: Engr 150, 150L; Math 81. Complex circuits, locus diagrams, network theorems, coupled circuits, nonlinear circuit elements, non-sinusoidal waves, pulses, transients, unbalanced three-phase circuits, symmetrical components, synthesis and design of circuits; applications of matrix algebra, Fourier series and integral, Laplace transforms.

152L. Electrical Circuit Analysis Laboratory (1)

Experiments and computations on networks, bridge circuits, coupled circuits, non-sinusoidal waves, pulses, transients, unbalanced three-phase circuits, and symmetrical components; experimental data analyzed according to modern data-analysis techniques. (3 lab hours; field trips)

153. Electrical Transmission (3)

Prerequisite: Engr 152, 152L, 155, 155L. Principles of transmission of electrical energy over wires at power and communication frequencies and through wave guides and space at ultra-high frequencies; filter circuits; design of transmission systems.

153L. Electrical Transmission Laboratory (1)

Experiments and computations involving electrical transmission of energy, including filter circuits. (3 lab hours; field trips)

155. Electric and Magnetic Fields (3)

Prerequisite: Engr 150, 150L, Math 81. Advanced topics in electricity and magnetism; fields and waves; emphasis on applications to engineering.

155L. Electric and Magnetic Fields Laboratory (1)

Advanced experiments and computations in electricity, magnetism, and in electromagnetic fields and waves. (3 lab hours; field trips)

156. Electronics (2)

Prerequisite: Engr 150, 150L. Electron tube and semiconductor electronics; introduction to basic systems; engineering applications and considerations.

156L. Electronics Laboratory (1)

Laboratory experiments in electronics; engineering applications. (3 lab hours)

157. Electronic Devices and Circuits (3)

Prerequisite: Engr 156, 156L. Physical electronics, characteristics and properties of electronic devices, both thermionic and solid state; theory of electronic circuits; analysis of linear feedback systems.

157L. Electronic Devices and Circuits Laboratory (1)

Experimental studies of electronic devices, circuits, and commercial type apparatus. (3 lab hours; fields trips)

158. Electronic Systems and Controls (3)

Prerequisite: Engr 153, 153L, 157, 157L. Applications of electronic circuits to engineering systems including communication, control, computer, television, telemetry radar, and microwaves systems; high-frequency techniques; special applications, and design considerations.

158L. Electronic Systems and Controls Laboratory (1)

Electronic measurements; laboratory studies of electronic systems. (3 lab hours; field trips)

162. Air Conditioning (3)

Prerequisite: Engr 165. Theory and practice in air conditioning including psychrometrics, load estimating, heating and cooling systems, fluid design and controls.

162L. Air Conditioning Laboratory (1)

Practical laboratory work with commercial type units; test of components of air conditioning systems. (3 lab hours; field trips)

164. Thermodynamics-Fluid Mechanics A (3)

Not open to students with credit in Engr 140, 140L; 160, 160L; 161, 161L; or 163, 163L. Prerequisite: Engr 130 (or concurrently). Fundamentals of thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

164L. Thermodynamics-Fluid Mechanics Laboratory A (1)

Prerequisite: Engr 164 (or concurrently). Application to thermo-fluid systems of experimental methods used in engineering practice. (3 lab hours)

165. Thermodynamics-Fluid Mechanics B (3)

Prerequisite: Engr 164. Continuation of Engr 164. Fundamentals of thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

165L. Thermodynamics-Fluid Mechanics Laboratory B (1)

Prerequisite: Engr 164L, 165 (or concurrently). Application to thermo-fluid systems of experimental methods used in engineering practice. (3 lab hours)

166. Advanced Thermodynamics-Fluid Mechanics (3)

Prerequisite: Engr 165. Advanced topics in thermodynamics, fluid mechanics, and heat transfer as applied to engineering problems.

166L. Advanced Thermodynamics-Fluid Mechanics Laboratory (1)

Prerequisite: Engr 165L, 166 (or concurrently). Application to thermo-fluid systems of advanced experimental methods used in engineering practice. (3 lab hours)

170. Engineering Economy (2)

Prerequisite: senior standing in engineering. Importance of economic analyses 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.

171. Legal Aspects of Engineering (2)

Prerequisite: senior standing in engineering. Development of law, canons of ethics, torts, principles of contracts, contracting procedure and specifications, property, negotiable instruments, sales, agency and patents; preparation of reports.

172. Senior Project (2)

Prerequisite: senior standing in engineering. Study of a problem by student under supervision of a staff member; final written report to the engineering staff. The project subject must be approved during the semester prior to enrollment. (Individual project except by special permission)

173. Analog Computation (2)

Prerequisite: Phys 4B, Math 77 (or concurrently). Introduction to electronic analog computer programming. (1 lecture, 3 lab hours)

180. Electrical Power Systems (3)

Prerequisite: Engr 151, 151L, 153, 153L, 156, 156L. Electrical power equipment and systems, operation and design, commercial practice and regulations; high voltage, lightning and surge phenomena; control and protection schemes; fault and stability calculations; introduction to nuclear power engineering.

180L. Electrical Power Systems Laboratory (1)

Experiments and computations on high-voltage and electrical power equipment and systems and associated apparatus; electrical design of power systems, commercial practice. (3 lab hours; field trips)

181. Automatic Control (2)

Prerequisite: Engr 151, 151L, Math 81. Theory and application of automatic control techniques; including hydraulic, pneumatic, electrical and electronic, inertial guidance, and nonlinear devices and systems; design, response, and stability of control systems.

181L. Automatic Control Laboratory (1)

Experiments and computations on automatic control devices and systems. (3 lab hours)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

IN-SERVICE COURSES

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

311. Professional Examination Review (2; may be repeated in different fields)

321. Professional Engineering Seminar (1-3; may be repeated in different fields)

SCHOOL OF PROFESSIONAL STUDIES

Aerospace Studies	281
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SCHOOL OF PROFESSIONAL STUDIES

Horace O. Schorling, Dean

<i>Department</i>	<i>Chairman</i>
Aerospace Studies.....	Lieutenant Colonel Eugene C. Watkins
Criminology.....	Frank M. Boolsen
Health Science.....	Henry F. Fricker
Home Economics.....	Ratana Newsome
Industrial Arts and Technology.....	Frank E. Schroeter
Journalism.....	Paul V. Sheehan
Nursing.....	Fannie L. Gardner

The School of Professional Studies consists of departments which prepare students for professional careers in teaching, business, industry, government, military service, and public service.

The Aerospace Studies Department provides precommissioning education and military training which, in conjunction with the bachelor's degree, qualifies a student for appointment as a second lieutenant in the United States Air Force. The Criminology Department offers both the bachelor of science degree and the master of science degree in the areas of law enforcement and correction. The Health Science Department offers a bachelor of arts degree and a concentration for use on the master of arts degree in education. The department is authorized to offer a program in public safety and accident prevention, including driver education and driver training. The Home Economics Department offers the bachelor of arts and master of science degrees. The Industrial Arts and Technology Department offers the bachelor of arts degree and the master of arts degree in industrial arts and the bachelor of science degree in industrial technology. The Journalism Department offers the bachelor of arts degree in journalism with concentrations in news-editorial, public relations and advertising, radio and television news communications, and technical journalism. The department is accredited by the American Council on Education for Journalism. The Nursing Department offers the bachelor of science degree in nursing and is accredited by the National League for Nursing and the California State Board of Nursing Education and Nurse Registration.

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: Watkins (Chairman)

Assistant Professors: Baumwell, Kinder

MINOR

A minor in aerospace studies consists of satisfactory completion of the AFROTC program (15 units).

AIR FORCE RESERVE OFFICER TRAINING CORPS PROGRAM

As a result of the Reserve Officer Training Corps Vitalization Act of 1964, all previous information concerning Air Force ROTC was superseded by a two-year program which became effective at Fresno State College in the summer of 1965. This new four-semester program is designed to provide prospective Air Force officers with the education, skills, and attitudes vital to the Air Force professional career officer. It is designed to qualify for officer's commissions those college men who desire to serve 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.

To be eligible for admission to AFROTC, 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 College.
- (3) Successfully complete the Air Force Officer Qualifying Test.
- (4) Successfully complete the Air Force physical examination.
- (5) Be selected for and satisfactorily complete AS 25.
- (6) 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.
- (7) Be approved for AFROTC training by the Professor of Aerospace Studies and the President of the College.
- (8) Execute a written agreement with the United States Government and the President of the College to complete the program contingent upon completion of baccalaureate requirements at the institution where he is enrolled or at another institution where such a program is given in the case of a transfer from one institution to another, and to accept an appointment as a commissioned officer in the Air Force upon graduation.
- (9) Enlist in the Air Force Reserve (Ineligible Reserve Section) for a period of six years.

Students with prior military service should consult the Professor of Aerospace Studies for applicable entrance requirements.

Cadets enrolled in AS 103A-B, 104A-B will receive a subsistence allowance of \$40 a month, paid quarterly. During attendance at AS 25, a prospective cadet receives subsistence, quarters, and a monetary allowance of \$90 a month for the six-week period, plus travel pay to and from the place of training. Reference books, officer-type uniforms, and textbooks are provided by the Air Force. All AFROTC payments or other benefits are in addition to those a veteran is entitled to under the GI Bill or other laws.

Field trips to Air Force bases and familiarization flights in Air Force aircraft are offered to enrolled students.

A 35-hour flight instruction program and an opportunity to qualify for a private pilot's license is offered to eligible seniors at government expense.

Applications should be submitted to the Professor of Aerospace Studies no later than the beginning of the spring semester preceding anticipated enrollment in AFROTC.

Courses

AEROSPACE STUDIES

25. Officer Basic Military Training Course (OBMT) (3)

Taken during summer preceding junior year before entry into AFROTC. Six-week military 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. Subsistence, quarters, \$90 monthly allowance, travel pay to and from designated Air Force base.

103A-B. Growth and Development of Aerospace Power (3-3)

Prerequisite: satisfactory completion of AS 25, or equivalent military training. Nature of war; 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. (3 class, 1 hour Corps training)

103C. Air Force ROTC Field Training (3)

Prerequisite: AS 103A-B. Required for four-year program cadets only. One month's military training taken during the summer at designated Air Force installations. Physical training, drill, weapon familiarization, familiarization flying, field exercises, orientation in United States Air Force base activities, equipment, and problems.

104A-B. The Professional Officer (3-3)

Prerequisite: AS 103A-B. Professionalism, leadership, and management; military professionalism; officer responsibilities; military justice; leadership theory, functions, practices; management principles, practices, controls, functions; systematic problem solving. (3 class, 1 hour Corps training)

CRIMINOLOGY DEPARTMENT

Professor: Boolsen (Chairman), Dienstlein

Associate Professors: Margosian, Tocchio

Assistant Professor: Kallam

Part-time: Clegg, Kilburn, McKinney, Quaschnick, Quinn

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.

Law Enforcement Option

	<i>Units</i>
Crim 4, 5, 7, 10, 72, 102, 105A-B, 113, 114, 129, 132, 140, 153.....	40
Crim 108 (or satisfactory experience).....	0-4
Elect from: A Ed 153, 172, Crim 170, Psych 25, PAC 24, 25, 121, 126, 127.....	6
Electives in psychology and sociology (ud).....	12

58-62

Additional Requirements: H Sc 48 (or first aid certificate); Jour 17A, Soc 1A, completion of A Ed 153 or Psych 25 recommended before graduate work.

Corrections Option

Crim 72, 105A-B, 120, 132, 133, 135, 136, 140, 153.....	30
Crim 181 (or satisfactory experience).....	0-3
S Welf 122, 124, 127.....	6
Elect from: Psych 147, PAC 24, 26, 121, 126, 127.....	6
Elect from: A Ed 153, 172, Crim 170, Psych 25.....	3
Electives in psychology and sociology (ud).....	15

60-63

Additional Requirements: Soc 1A; completion of A Ed 153 or Psych 25 recommended before graduate work.

CREDENTIAL PROGRAM

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

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 College. 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 College, see the *Graduate Bulletin*, available in the Office of the Dean, School of Graduate Studies.

*Courses***CRIMINOLOGY****4. Patrol Procedures (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 force.

5. Traffic (2)

Open only to criminology majors. Primary traffic functions of the police; traffic law enforcement; traffic direction; accident investigation; contemporary problems; California Vehicle Code.

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)

10. Police Records (2)

Open only to criminology majors. Organization and installation of a police record system; types and functions of records; recording procedures.

72. Report Writing (3) (Former Engl 72)

Prerequisite: Engl 1 or equivalent. Methods of explaining processes and theories; reporting special investigations; preparing technical and narrative reports; general practices of written communications.

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.

105A-B. Criminal Law (3-3)

(A) Advanced study of theory, concepts, and philosophy of criminal law through case study method. (B) Laws of arrest, search and seizure; criminal procedure; criminal evidence; juvenile law, through case study method.

108. Directed Policing (1; max total 6) (Former Crim 8)

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 students. Supervised field experience in police work for interpreting theories developed in parallel criminology courses. Weekly conference with supervisor. (Minimum of 3 field hours per unit.)

113. Criminalistics I (4) (Former Crim 115A)

Open only to criminology majors. Prerequisite: Crim 4. Advanced study of scientific crime investigation and detection methods. (3 lecture, 3 lab hours)

114. Criminalistics II (3) (Former Crim 115B)

Open only to criminology majors. Prerequisite: Crim 4. Criminal identification systems; identification of persons and property; physical evidence; scientific resources and techniques.

120. Crime Prevention and Juvenile Delinquency (3)

Prerequisite: Soc 1A or permission of instructor. Organization and function of crime prevention agencies; police techniques in the prevention of delinquency and crime; case work; the policewoman; consolidation of community resources in preventing crime and delinquency.

129. Detection of Deception (3)

Open only to criminology majors. Prerequisite: Crim 4 or permission of instructor. Historical, physiological, psychological and legal aspects of criminal interrogation; detection of deception techniques; theory and practice of instrumental detection of deception and other interrogation aids; laboratory experiments with polygraph. (2 lecture, 3 lab or demonstration hours)

132. Criminology (3)

Prerequisite: Soc 1A or permission of instructor. Theories of crime causation, sociological factors; organized crime and 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. May include field trips.

135. Probation and Parole (3)

Prerequisite: Crim 120, or 132, or permission of instructor. Principles and practices in probation and parole.

136. Topics in Corrections (3)

Prerequisite: senior or graduate standing in corrections. Critical analysis of recent trends in the correctional process; intensive investigation and discussion of selected topics in corrections.

140. Human Relations (3)

Prerequisite: Soc 1A or permission of instructor. Nature and causes of complex problems in people-to-people relations; related role of agencies of criminal justice in a democratic society.

153. Psychology of the Criminal (3) (Same as Psych 153)

Psychological bases of crime; motivation, alcoholism, economic and cultural pressures; forms of crime; criminal careers.

170. Research in Criminology (3)

Not open to students with credit in Crim 200. 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)

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)

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES*(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) (Former Crim 204, 208)

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 9 if no topic repeated) (Former Crim 225A-B, 229)

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 postinstitutional guidance of released persons.

270. Problems in Criminology (1-6; max total 6 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 *Regulations and Procedures—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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

302. Topics in Criminology (1-3)

HEALTH SCIENCE

Professors: Fricker (Chairman), Lindly

Associate Professors: Fikes, Kimberly

Assistant Professor: Liskey

Part-time: Caffee, DeFries, Fryer, Fung, Koontz, Mortenson, Reich

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, public health, and sanitation. A concentration in health science is also available for use on the master of arts degree in education.

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 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.

	<i>Units</i>
<i>Health Science Core</i>	15
H Sc 101, 105, 123, 140, 157	
Elect one option below.....	15
<i>Health and Safety Option</i>	
H Sc 110, 156, 170	
Elect from: H Sc 162, H Ec 131, 137, Psych 111	
<i>Public Health Option</i>	
H Sc 115, 116, Soc 147	
Elect from H Sc 155, 163, Soc 111	
<i>Sanitation Option</i>	
H Sc 155, 158, 159, 163, 165	

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 ARTS DEGREE

A special interest area in health science may be incorporated in the master of arts degree in education. 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.

CREDENTIAL PROGRAMS

For information on the current credential programs consult departmental advisers and see the sections on *Public School Credentials* and the *School of Education*.

**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 Sc 48, 105, 148, 170, 205, 285F. For further information, consult the department adviser.

THE STANDARD DESIGNATED SERVICES CREDENTIAL WITH SPECIALIZATION IN HEALTH

This credential authorizes the holder to serve as a school nurse or in other designated health services. For specific information, consult the Nursing Department.

Courses

HEALTH SCIENCE DEPARTMENT

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 (2)

Meets general education requirements. Significance of basic health problems applicable to the young adult and to society.

91. Health Information (1)

Meets general education requirements. Not open to students with credit in H Sc 90. A synthesis of scientific knowledge from the contributing disciplines which relate to an understanding of health problems.

101. Principles of Public Health (3)

Introduction to the field, philosophy of public health; the community as patient of the public health agency.

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.

110. Habit Forming Substances (3)

Problems of tobacco, depressants, and stimulants including hallucinogens; use and effects on adolescents and adults.

115. Public Health Education (3)

Prerequisite: completion of core program. The education process in public health and health education activities including community health profile studies; application of group processes to health education.

116. Public Health Education (3)

Prerequisite: completion of core program. Psychological and educational criteria in the selection of public health education media and materials, technical aspects of their use, evaluation procedures; working with citizen groups.

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.

140. Survey of 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.

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.

156. Source Materials (2)

Prerequisite: H Sc 123. Exploration, evaluation, and teaching materials in health.

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: Bact 54 or H Sc 155, or permission of instructor. Public health statistics and principles of epidemiology; methods of investigating epidemics, collecting of data, analysis and reports.

159. Environmental Sanitation (3)

Prerequisite: H Sc 158 or permission of instructor. Fundamentals of housing, heating, ventilation, lighting, water supply, waste disposal; insect and rodent control; control of milk and other food supplies.

162. Principles of Audiology (3) (See Sp Corr 162)**163. Public Health Administration (3)**

Principles of public health administration; fundamentals of organization and administration in public health.

165. Directed Group Study in Sanitation (3)

Prerequisite: H Sc 159, permission of instructor. Problems of sanitation and sanitary inspections 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)

190. Independent Study (1-3; max see reference.)

See *Regulations and Procedures—Independent Study*.

GRADUATE COURSES

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

205. Safety Problems and Programs (2)

Prerequisite: H Sc 105, 285F concurrently. Development, organization, and administration of safety programs; investigation and analysis of pertinent problems.

210. Administration of the School Health Program (3)

Prerequisite: H Sc 123. Organization, administration, and legal aspects of the school health program.

220. Physical Handicaps (2)

Prerequisite: H Sc 123, 285F concurrently. Cause, treatment, and educational implication of crippling conditions, including cerebral palsy of preschool and school-age children; rehabilitation and adjustment problems.

223. Advanced School Health Education (2)

Prerequisite: H Sc 123, 285F concurrently; teaching experience or permission of instructor. Critical analysis and evaluation of the total school health program; curriculum materials, and special techniques relating to instruction, services, and environment.

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. Community Health Organization (2)

Prerequisite: H Sc 123, 157, 285F concurrently. Planning educational aspects of community health programs; group procedures; community organization; selection, development, and use of media.

280. Problems in Health (2)

Prerequisite: permission of instructor. Problems in health studied through observation of school situations; review of the literature; trends.

285F. Field Work in Health (1; 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.

298. Seminar in Health Education (4)

Prerequisite: advancement to candidacy for MA degree in education; B average on 24 units of MA program including A Ed 220 and 6 units on Fresno campus. Research in solution of problems in health education. Individual research papers required; weekly group discussions, weekly individual conferences; and hours arranged.

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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

302. Selected Topics in Health (1-3)

HOME ECONOMICS DEPARTMENT

Professors: Porch, Smardan

Associate Professors: Newsome (Chairman), Rose

Assistant Professors: Hendrickson, Kissick, Kuehn, M. Rohrer, Schaudt, Sollie, V. Taylor

Part-time: Alexander, B. Cehrs, Plaunt, Thoren

The Home Economics Department offers a major and a minor in home economics for the bachelor of arts degree and a program leading to the master of science degree. Programs may be planned to provide preparation for teaching careers in preschool, elementary, and secondary schools. Professional careers also include dietetics, nutrition, and related areas. In addition to preparing students for a career, all curricula are planned to develop background knowledge, appreciation, and skills useful in family life.

HOME ECONOMICS MAJOR

The bachelor of arts degree major in home economics consists of the following 41 units:

	<i>Units</i>
H Ec 1, 10, 11, 12A, 12B, 38, 39, 40, 50.....	23
H Ec 105, 110, 111, 131, 132, 137, 139.....	18
	<hr/> 41

Biol 2A and Chem 2A-B are prerequisite to some courses required for the major.

With departmental approval students may make adaptations in the core for specific career objectives as recommended below:

Home Economics Education. A major in home economics supplemented by other requirements for teaching credentials.

Home Economics and Dietetics. A major in home economics including such courses as quantity cookery, institutional management and dietetics and meeting the American Dietetic Association requirements in such fields as chemistry, bacteriology, physiology, and accounting. A year of internship in an approved institution upon completion of the bachelor's degree is required for membership in the American Dietetic Association.

Home Economics and Professional Occupations. The preparation of students for entry into professional occupations, exclusive of teaching, dietetics, and nutrition, which are directly related to home economics, may be arranged when there are employment opportunities.

HOME ECONOMICS MINORS

Requirements listed below may be varied with permission to meet individual needs and interests depending on students' majors.

General Minor	<i>Units</i>
H Ec 10, 12A, 38, 39, 40.....	12
H Ec 101 or 133, 131.....	4
Home economics electives (incl 2 ud)	4-5
	<hr/> 20-21

Minor for Business Majors

H Ec 38, 40, 43.....	5
H Ec 132, 6 units elective (incl 4 ud).....	8
	<hr/>

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*.

Courses**HOME ECONOMICS****1. Dynamics of Family Relations (2)**

Personal and social development of the individual through stages of family cycle, dynamics of family interaction, socio-economic and cultural influence.

2. Home and Family Life (3)

Modern homemaking in theory and practice; house plans, furnishings and equipment; family finance; meal planning, preparation and service; selection of china, glass and silver. Activities in practice apartment. (2 lecture, 4 lab hours)

10. Basic Food Study (3)

Not open to students with credit in H Ec 10A. Planning and preparation of family meals based on economic, nutritional, psychological, sociological, and aesthetic principles. (2 lecture, 4 lab hours)

11. Textiles (3)

Principles of fabric production; characteristic use and care of natural and man-made fibers, use and care of new finishes; laboratory testing to determine the ability of the fabrics to withstand normal wearing conditions. (2 lecture, 2 lab hours)

12A. Clothing Construction (3)

Clothing and pattern selection with analysis of figure and fabric, basic theories influencing skills and techniques, use of commercial patterns. (2 lecture, 3 lab hours)

12B. Clothing Construction (3)

Continuation of H Ec 12A. Advanced problems in construction; use of modern fabrics; development of originality in design. (1 lecture, 5 lab hours)

31. Dietetics (2)

Elements of nutrition and diet in disease; principles involved in feeding the sick. (1 lecture, 3 lab hours)

38. Housing and Home Furnishing (2)

Basic principles in selecting and furnishing a satisfying home; design and functional consideration in selection of floor coverings, wall finishes, draperies, lighting, furniture, and accessories.

39. The Child in the Family (2)

Open to non-majors. Prenatal care of mother and child; development and guidance of children from birth to twelve years in relation to the family group. Supervised observation of children in nursery schools, hospitals, child guidance clinics.

40. Elementary Nutrition (2)

Principles of nutrition for promotion of good family health, requirements at different stages of growth and development, minimum food budgets in relation to optimum nutrition.

42. Management for Effective Living (2)

Separate sections for men and women; not open to home economics majors. Human relationships, child care and development, foods and nutrition, care and selection of clothing, family finance and consumer problems.

43. Social Procedure (1)

Present day social procedure; introductions and social correspondence; table service and etiquette; selection of china, glassware, silver.

50. Household Equipment (3)

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. (2 lecture, 2 lecture-lab hours)

100. Advanced Clothing (3)

Prerequisite: H Ec 12A-B. Tailoring a suit or coat; draping, using individual dress form.

101. Consumer Economics (2)

Consumer spending with consideration of the family cycle and American economy; social and psychological factors influencing consumer behavior.

105. Food Science (3)

Prerequisite: H Ec 10, Chem 2A-B. Application of principles of chemistry, physics, and bacteriology to the study of foods; principles of food preservation. (2 lecture, 4 lab hours)

110. Home Management (2)

Management principles related to creative and satisfying family living; analysis of values, goals, and standards; relationship of resources, human and other, to the management process.

111. Home Management Laboratory (3)

Prerequisite: H Ec 40, 50, 105, 110 (or concurrently). Integrated experience in various phases of home economics provided by residence in home management house.

130. Experimental Food Study (2)

Prerequisite: H Ec 105. Structure and composition of foods, their behavior during processing; experimental food study; food demonstration techniques. (2 lecture, 2 lab hours)

131. Marriage and the Family (2)

May be used to fulfill 2 units of the general education requirement. Appreciation of and an intelligent approach to the problems and responsibilities of marriage and family life; functions, status and problems of the present-day American family; factors basic to success; legal aspects of marriage; psychology and physiology of sex.

132. Family Finance (2)

Practical financial problems of the individual and family; bank accounts, consumer credit, insurance, savings, and investments; wills, property laws, home mortgages; personal and family budgets; efficient buying practices.

133. History of Housing and Home Furnishings (2)

Development of the home and its furnishings from early Egyptian period to present; sociological, economic, geographic, and religious influences affecting design; styles of various periods coordinated in home of today.

137. Advanced Nutrition (3)

Prerequisite: H Ec 40, Chem 2A-B, Biol 2A. Metabolism of carbohydrates, fats, and proteins; vitamins and minerals; recent developments in the field. (2 lecture, 2 lecture-lab hours)

138. Diet in Disease (2)

Prerequisite: H Ec 137 or permission of instructor. Metabolism in disease and adaptation of diet to meet existing conditions. (2 2-hour lecture-labs)

139. Child Development (3)

Prerequisite: H Ec 39 or permission of instructor. Application of principles of development and guidance in specific situations in the child development laboratory. Directed observation and participation in guiding children in the nursery school; opportunities to work with parents. (2 lecture, 3 lab hours)

140. Methods of Teaching Home Economics (3)

Philosophy and procedures of homemaking education in secondary schools; factors in homemaking teaching competence; observation in public schools. (2 lecture, 2 lab hours)

141. Institution Organization and Management (3)

Institution food service organization and operation; management principles; methods of control, selection, and training of personnel; food cost control and record keeping.

142. Quantity Cookery (3)

Prerequisite: H Ec 10, 105, junior standing. Calculation of raw materials needed; experience in quantity food preparation and service; use and care of institution food service equipment. (2 lecture, 4 lab hours)

143. Institution Experience (3)

Open only to dietetics majors. Prerequisite: H Ec 138, 141, 142. Supervised work experience in hospital dietary departments. (Lecture-lab hours arranged)

144. Marketing, Equipment and Plant Layout (3)

Wholesale market functions and purchase of food for institutional use, factors determining quality and cost; floor plan and layouts; materials, construction, specifications, and maintenance of equipment, furniture, and furnishings for institution food units.

190. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

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.

280. Topics in Food and Nutrition (3; max total 12 if no area repeated)

Prerequisite: H Ec 200, professional requirements in the field, permission of instructor. Recent developments in food and nutrition research; clinical nutrition; child and/or geriatric nutrition; problems of world food and nutrition.

281. Advanced Studies in Home Economics (3; max total 12 if no topic repeated)

Prerequisite: H Ec 200, home economics core; courses in chemistry, psychology, biology, art, anthropology-sociology or permission of instructor. Seminar in areas of family relations, textiles, clothing, housing, family finance, child development.

IN-SERVICE COURSES

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

380. Topics in Home Economics (1-3; max total 9 if no area repeated)

INDUSTRIAL ARTS AND TECHNOLOGY DEPARTMENT

Professors: Bliss, Dunning

Associate Professors: Schroeter (Chairman), L. Aldrich, Dettinger, Feuches, McComas, Newcomb, Rockwell

Assistant Professors: Blanton, Blomgren, Bockman, Goishi, Gonser, Gysler, Livingston, Musick

Part-time: Hultsman, R. Levy, Turkot

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 IA 192, 194, 196, 197, 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

	<i>Units</i>
IA 12, 41, 52, 60, 70, 80.....	18
IA electives (incl at least 16 u.d.).....	22
	<hr/> 40

Industrial Arts Minor

One of the eight groups listed below should be selected for a minor in Industrial Arts.

Automotive

IA 12, 71, 113, 114, 124, 129.....	17
Industrial arts electives.....	3
	<hr/> 20

Drafting and Design

IA 41, 42, 140, 143, 146, 148.....	16
Industrial arts electives.....	4
	<hr/> 20

Electricity and Electronics

IA 52, 70, 152, 153, 156, 158.....	18
Industrial arts electives.....	2
	<hr/> 20

General Metal

IA 41, 70, 71, 74, 170, 177.....	16
Industrial arts electives (incl at least 2 u.d.).....	4
	<hr/> 20

	<i>Units</i>
Graphic Arts	
IA 60, 160, 162, 164, 166.....	13
Industrial arts electives.....	7
	<hr/> 20
Industrial Crafts	
IA 70, 80, 133 (4 un), 146, 162, 177, 179.....	18
Industrial arts electives.....	2
	<hr/> 20
Machine Tool Metal	
IA 41, 70, 71, 74, 170, 174.....	17
Industrial arts electives.....	3
	<hr/> 20
Woodworking	
IA 41, 80, 82, 184, 186.....	15
Industrial arts electives.....	5
	<hr/> 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*). In addition to a core program consisting of industrial arts courses and courses in related areas, and the specific requirements in one of the options, each student majoring in industrial technology must also complete Econ 1A-B, Physics 2A-B.

Industrial Technology Major

Each industrial technology major must complete the following core program.

	<i>Units</i>
IA 41, 52, 70, 146, 166, 197, 199.....	20
Acct 1A, Bus Ad 151, 160, Math 71, 72, Engr 11, 11L.....	18
	<hr/> 38
Automotive Industries Option	
IA 12, 71, 74, 113, 114, 124, 129.....	20
Electives in related areas approved by department.....	23
	<hr/> 43
Drafting Industries Option	
IA 42, 71, 74, 140, 143.....	14
Art 9, Engr 1, 1L, Geog 115.....	8
Electives in related areas approved by department.....	21
	<hr/> 43
Electrical Industries Option	
IA 71, 74, 152, 153, 154, 156, 158.....	20
Electives in related areas approved by department.....	23
	<hr/> 43

	<i>Units</i>
Graphic Arts Industries Option	
IA 60, 71, 74, 160, 162, 164, 196	17
Art 3, Mkt 140, 141	8
Electives in related areas approved by department	18
	<hr/> 43
Metal Industries Option	
IA 71, 74, 170, 171, 173, 174, 175, 176	22
Electives in related areas approved by department	21
	<hr/> 43
Wood Industries Option	
<i>Wood Technology Emphasis</i>	
IA 80, 82, 182, 184, 186	15
Chem 2A-B, 8	9
Electives in related areas approved by department	19
	<hr/> 43
<i>Building Construction Emphasis</i>	
IA 80, 82, 181, 182, 186	15
AgM 91	2
Electives in related areas approved by department	26
	<hr/> 43

BACHELOR OF VOCATIONAL EDUCATION DEGREE

This degree is limited to candidates recommended by the State Board of Examiners for Vocational Teachers. The applicant will have received, through this Board of Examiners, credit for occupational, managerial, and supervisory experience of from 20 to 40 units to be applied toward the major. Credits earned in Trade and Industrial Teacher Training will be applied toward a minor.

Each applicant for the degree shall have completed 124 units with a grade-point average of 2.0 or better (on a four grade-point system), including credits allowed by the Board of Examiners.

	<i>Units</i>
General Education	45
Major in Vocational Education (24 lower division; 12 upper division)	36
(Board of Examiners evaluation plus upper division courses to total 36 units.)	
Minor in Vocational Teacher Training	18
Electives (general or professional)	25
	<hr/> 124

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*. Under the revised credential structure effective January 1, 1964, a candidate for a standard teaching credential must complete a subject matter major and a minor, one of which must be classified as academic. A minor used with a nonacademic major must contain 12 upper division or graduate units. Majors and minors must be in subjects normally taught in the public schools.

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 College. Twenty of the 30 units required for the degree must be in industrial arts. For specific require-

ments, consult the chairman of the department; 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.

Courses

INDUSTRIAL ARTS AND TECHNOLOGY

Note: Industrial arts and technology courses have been renumbered and re-grouped under the following areas: automotive, crafts, drafting-design, electricity-electronics, graphic arts, metals, woodworking, professional, and graduate.

AUTOMOTIVE AREA

IA 12. Basic Automotive Systems (3) (Former IA 9)

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. (lecture-lab)

IA 113. Advanced Automotive Systems (3) (Former IA 109A)

Prerequisite: IA 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. (lecture-lab; field trips)

IA 114. Automotive Technical Problems (3) (Former IA 116)

Prerequisite: IA 12. Automotive air conditioning, body applications, diesel, fuels and lubricants technology, small horsepower engines and laboratory organization. (lecture-lab; field trips)

IA 124. Automotive Diagnosis and Correction (3) (Former IA 109B)

Prerequisite: IA 12. Automotive testing, servicing and repair processes applied to engine, power transmission, and chassis components. (lecture-lab; technical reports)

IA 129. Automotive Systems Repair Procedures (3) (Former IA 110)

Prerequisite: IA 12. Technology of engine rebuilding, carburetor and electrical service, power transmission, brakes and wheel suspension, body work and tune-up. (lecture-lab; technical reports)

CRAFTS AREA

IA 34. Theatre Craft (3) (See Drama 34)

IA 130. Handwork in Elementary Education (3)

Limited to elementary credential candidates. Introduction to handwork for elementary schools; handwork units correlated with various subjects in elementary curriculum; development and fabrication of teaching aids.

IA 133. Industrial Crafts (2; max total 4) (Former IA 108A-B)

Creative and recreational experiences in craft media including plastics, leather, wood, metal, enamels; historical, cultural, technological information. (lecture-lab)

IA 134. Advanced Theatre Craft (3) (See Drama 134)

DRAFTING-DESIGN AREA

IA 41. Applied Drawing (3) (Former IA 19)

Grammar and composition of drawing, sketching, lettering, orthographic projection, working drawings, auxiliary views, dimensioning, developments, pictorial drawing, and duplication.

IA 42. Architectural Drawing (3) (Former IA 22)

Architectural drafting techniques and standards; progress from fundamentals to completing light construction working drawings, floor plans, elevations, details; application of city and county codes.

IA 140. Machine Drawing (3) (Former IA 121)

Prerequisite: IA 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.

IA 143. Architectural Drawing (3) (Former IA 122)

Prerequisite: IA 41 or permission of instructor. Mechanical perspective, its theory and practical application to architectural and industrial problems.

IA 146. Materials of Product Design (2) (Former IA 150)

Prerequisite: IA 41 or permission of instructor. Selection and use of materials in industrial arts design; organization and experimentation in two- and three-dimensional problems using varied media in industrial arts projects.

IA 148. Product Design (2) (Former IA 151)

Prerequisite: IA 41 or permission of instructor. New scientific developments related to design problems and industrial products; relationship of two- and three-dimensional expression in space, form and function techniques, skills of the craftsman.

ELECTRICITY-ELECTRONICS AREA**IA 52. Basic Electricity (3) (Former IA 11)**

Introduction to electricity including fundamentals of electrostatics, alternating and direct current electrical circuits, electrical calculations, magnetics, circuit applications, electrical measuring and test equipment. (lecture-lab)

IA 152. Fundamentals of Electronics (3) (Former IA 111B)

Prerequisite: IA 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. (lecture-lab)

IA 153. Advanced Electronics (3) (Former IA 111C)

Prerequisite: IA 152. Electronic systems and applications including basic transmitters, amplitude and frequency modulation transmitters and receivers; transistor applications; antennas; television. (lecture-lab; field trips)

IA 154. Industrial Electronics (3)

Prerequisite: IA 153. Industrial electronics systems analysis; applications of electronic circuits and devices to industrial process and machine control. (lecture-lab; field trips)

IA 156. Fundamentals of Electrical Machines (3) (Former IA 111A)

Prerequisite: IA 52. Power generation; energy conversion equipment; alternating and direct current motors and generators. (lecture-lab; field trips)

IA 158. Fundamentals of Electrical Power Distribution and Wiring (3) (Former IA 111D)

Prerequisite: IA 52. Electrical power distribution equipment and systems; industrial and residential wiring circuits, devices and systems; local and national electrical codes. (lecture-lab; field trips)

GRAPHIC ARTS AREA**IA 60. Basic Graphic Arts (3) (Former IA 26)**

Introduction to the graphic arts; hand composition, paper making, stereotype, rubber-stamp, thermography, marbling; experiences in relief printing methods; overview of entire printing industry. (lecture-demonstration; student projects, field trips)

IA 160. Advanced Graphic Arts (3) (Former IA 127)

Prerequisite: IA 60 or permission of instructor. Typographic layout and design; problems of book manufacture; principles of advertising layouts; hand, machine, and photographic typesetting methods; experience in running automatic printing press and typesetting machine. Field trips.

IA 162. Graphic Arts Crafts (2) (Former IA 128)

Various processes and media used in the graphic arts industry; creative and recreational aspect for the student; silk screen, linoleum block, flexography, intaglio, stereotype, papermaking, thermography, marbling, student projects. Field trips.

IA 164. Bookbinding (2) (Former IA 142)

Historical development of the book and its influence on our society; preparation for publication, methods of reproduction and materials used; projects in binding and rebinding; yearbook and textbook problems. Field trips.

IA 166. Graphic Reproduction Techniques (3) (Former IA 145)

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.

METALS AREA**General Metalworking****IA 70. Basic Metalworking (3) (Former IA 40)**

Introduction to and exploration in various metal areas including sheet metal, bench metal, art metal, wrought iron, foundry and forging.

IA 170. Advanced Principles of Metalworking (3) (Former IA 119)

Prerequisite: IA 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**IA 71. Metallurgical Processes (2) (Former IA 6)**

Fundamentals of metallurgy; properties and characteristics of metals; survey of metal welding processes, equipment, and procedures; introduction to destructive and nondestructive testing methods. (lecture-lab)

IA 171. Advanced Metallurgical Processes (2) (Former IA 106)

Prerequisite: IA 71. Design of weldments; welding drafting and symbols; production processes and techniques; production economy. (lecture-lab)

Sheet Metalworking**IA 173. Metal Fabrication Processes (3) (Former IA 118)**

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**IA 74. Basic Machine Tool Metalworking (3) (Former IA 10A-B)**

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. (lecture-lab)

IA 174. Advanced Machine Tool Metalworking (3) (Former IA 112)

Prerequisite: IA 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. (lecture-lab)

IA 175. Machine Tool Technical Problems (3) (Former IA 115)

Prerequisite: IA 74. Technical problems in design, layout, fabrication, machineability 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. (lecture-lab)

IA 176. Advanced Machine Tool Problems (3)

Prerequisite: IA 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**IA 177. Metal Craft (2) (Former IA 117A)**

Technological, scientific, historical, cultural, and economic aspects of the nonferrous metals and the industries to which they relate; individually designed and hand crafted articles produced through coordinated laboratory experiences. (lecture-lab)

IA 179. Jewelry (2; max total 4) (Former IA 107)

Designing and executing articles of jewelry using a wide range of traditional and contemporary materials and techniques; historical, cultural, economic, scientific and technological aspects of jewelry coordinated with laboratory experiences. (lecture-lab)

WOODWORKING AREA**IA 80. Basic Woodworking (3) (Former IA 1)**

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.

IA 82. Wood Machining (3) (Former IA 2)

Prerequisite: IA 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.

IA 181. Wood Frame Building Construction (3) (Former IA 100)

Principles of wood frame construction including foundations, framing, exterior finish and related areas of layout, estimating and ordering materials; conventional and modular component systems.

IA 182. Advanced Wood Machining (3) (Former IA 101)

Prerequisite: IA 82. Construction of furniture, cabinet work and millwork; design, construction details, production methods; analysis of cutting processes.

IA 184. Woodworking Specialties (3) (Former IA 103)

Prerequisite: IA 82. Specialized activities related to field of woodworking; wood finishing and paint technology, machine installation and maintenance, upholstering, inlaying and veneering, advanced wood turning, furniture restoration.

IA 186. Wood Technology (3) (Former IA 104)

Prerequisite: IA 82 or permission of instructor. Properties and uses of wood, lumber grading, lumber and wood products manufacturing, wood seasoning and preserving, plywood and laminated wood, glue and glued products, fiber and particle boards. (lecture-lab)

PROFESSIONAL COURSES**IA 190. Independent Study (1-3; max see reference)**

See *Regulations and Procedures—Independent Study*.

IA 192. Industrial Arts Education in Secondary Schools (3) (Former IA 123)

Prerequisite: SEd 151. Principles, objectives, and recent trends in modern industrial arts instructional practices, including group observation.

IA 194. Course Materials in Industrial Arts Education (2) (Former IA 125)

Prerequisite: IA 192. Development and use of written instructional materials; analysis and organization of course content for various subjects in industrial arts areas.

IA 196. Graphic Communications (2) (Former IA 126)

Preparation and use of instructional aids, including models, mockups, cutaways, charts, educational films, slides, overlays; photographic processes; planning, construction, classroom demonstration and evaluation.

IA 197. Energy Utilization and Instrumentation (3)

Fundamental sources of energy; energy converters using direct mechanical force, external combustion, internal combustion, and electricity as energy sources; mechanical, thermal, and electrical instrumentation for industrial process indication and control.

IA 199. Senior Problem in Industrial Technology (3)

Prerequisite: senior standing in industrial technology. Approved problem or research project in the area of the student's option.

GRADUATE COURSES

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

IA 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; sociological, historic, economic, and philosophic implications.

IA 270. Technical Problems (2-3; max total 6 if no area repeated)

Technical work in selected areas; research under supervision of instructor.

IA 280. Problems in Industrial Arts Research (2)

Seminar in research procedures in the industrial arts; basic bibliography, research form and method.

IA 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.

IA 285. Planning Industrial Arts Facilities (2)

Planning and organizing various types of school shops; architectural considerations, selection and specifications of equipment. Field trips.

IA 286. Safety and Related Problems (2)

Research and study of safety problems in industrial education; planning and evaluation of specific safety programs.

IA 287. Planning and Organizing Industrial Arts Curriculum (2)

Modern industrial arts curriculum; organization and management; recent trends concerned with equipment, supplies, content, safety, and methods.

IA 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.

IA 290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

IA 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

Note: In-service courses (300 series) are not intended for use on degrees except by special, prior approval. See Extension and Summer Session Bulletins for course descriptions.

IA 341. Problems in Industrial Arts (2; max 6 if no area repeated)

JOURNALISM DEPARTMENT

Professors: Sheehan (Chairman), Duke, Shepard

Associate Professor: Margosian

Assistant Professor: Molen

Instructor: Rehart

Part-time: R. Brown

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.

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

A bachelor of arts degree in journalism requires proficiency in communication. Students must pass English 1 equivalent with a minimum grade of C and pass a typing test. All journalism majors are required to take a core of courses, totaling 20 units, in the news-editorial field as part of the major program. The remaining journalism courses needed to meet major requirements may be chosen in one of following areas of specialization: news-editorial, public relations and advertising, radio and television news communication, and technical writing and editing.

News-Editorial	<i>Units</i>
Jour 8A-B, 109A-B, 110A-B, 114, 115	20
Jour 104, 108, 126, 181	11
Elect from: Jour 1, 2, 17A, 17B, 102, 117, 124, 149, 150	5

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Additional Requirements (beyond general education requirements): IA 60;
6 units (incl. 3 ud) social science; 6 units literature.

Journalism with Emphasis on Public Relations and Advertising	
Jour 8A-B, 109A-B, 110A-B, 114, 115	20
Jour 113, 145A-B, 146A-B	11
Elect from: Jour 1, 2, 17A, 17B, 106, 117, 149, 150, 181	5

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Additional Requirements: IA 60; Psych 145; 6 units marketing.

Journalism with Emphasis on Radio and Television News Communication	
Jour 8A-B, 109A-B, 110A-B, 114, 115	20
Jour 17A, 128	5
Elect from: Jour 1, 2, 17B, 108, 117, 126, 149, 150, 181	5

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Additional Requirements: R-TV 40, 41 or 44, 142, 147.

Journalism with Emphasis on Technical Writing and Editing	<i>Units</i>
Jour 8A-B, 109A-B, 110A-B, 114, 115.....	20
Jour 106, 124, 126.....	8
IA 60.....	3
Electives in related areas approved by department chairman.....	12
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MINOR

News-Editorial	
Jour 8A-B, 109A, 110A, 114, 115.....	15
Journalism elective (3 ud).....	5
	20

Journalism with Emphasis on Public Relations and Advertising	
Jour 8A-B, 106, 113, 145A, 146A.....	15
Journalism elective (3 ud).....	5
	20

Journalism with Emphasis on Radio and Television News Communication	
Jour 8A-B, 108, 128.....	12
Journalism electives (6 ud).....	8
	20

Additional Requirements: R-TV 40, 41 or 44, 144.

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*.

Courses

JOURNALISM

1. Introduction to Mass Communications (2)

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.

8A-B. Reporting (3-3)

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)

17A. Introduction to Photography (2)

Not open to students with credit in Art 101. Still-photography; use of a variety of camera equipment for black-and-white pictures; pictures taken and films and prints processed in laboratory sessions. (1 lecture, 3 lab hours)

17B. Press Photography (2)

Prerequisite: Jour 17A or permission of instructor. Use of news cameras for photographic reporting; evaluation of pictures for publication; laboratory experience in use of flash and extension lighting, filters, and high-speed processing methods. (1 lecture, 3 lab hours)

102. The Press and World Affairs (3)

The role of the international press in collecting and disseminating national and foreign news.

104. Journalism in American Society (3)

Historical backgrounds of American press; development from colonial to modern times; newspapers and allied media as political and social forces.

106. Industrial Journalism (2)

Survey and analysis of internal and external publications produced by business and industry.

108. Reporting of Public Affairs (3)

Prerequisite: Jour 8A-B or permission of instructor. Methods of reporting the courts and municipal, county, state, and federal governments.

109A-B. Contemporary Problems of the American Press (2-2)

Prerequisite: Jour 8B or permission of instructor. Advanced reporting problems; handling news in depth; news policies and ethics; and specialized reporting.

110A-B. Advanced Reporting (3-3)

Not open to students with credit in Jour 109A-B prior to fall 1962. Prerequisite: Jour 8A-B; Jour 109A-B must be taken concurrently. Practice in handling advanced news writing and reporting assignments in the environment of a newsroom. College newspaper used as a laboratory. (10 hours arranged)

112. School Public Relations (2) (Same as A Ed 112)

Organization and analysis of a public relations program for elementary and secondary schools.

113. Public Relations (3)

Role of public relations in business and industry, education, and other fields; public relations programs and problems.

114. Editing of Publications (3)

Prerequisite: Jour 8A. Editing copy; writing headlines; using type effectively; handling telegraph copy; making up newspapers, trade and industrial publications, house organs and magazines, lab use of college newspaper. (2 lecture, 2 lab, 2 hours arranged)

115. Copyreading (1)

Reading copy and writing headlines. College newspaper used as a laboratory. (4 hours arranged)

117. Advanced Press Photography (2)

Prerequisite: Jour 17B or permission of instructor. Field and laboratory work in the production of the picture story, magazine and advertising illustrations on assignment; advanced processing methods including use of color materials. (1 lecture, 3 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 8A or permission of instructor. Gathering and preparing news for broadcasting and telecasting; work with local stations.

131. Principles of High School Journalism (2)

Instruction in methods of advising and preparing high school newspapers and yearbooks.

132A-B. Yearbook Production (1-1)

Layout practice, writing of copy, and organization of yearbook. College annual used as a laboratory. (1 lecture, 3 hours arranged)

140. Introduction to Advertising (3) (See Mkt 140)**141. Advertising Production and Media (2) (See Mkt 141)****142. Radio and Television News Broadcasting (3) (See R-TV 142)****144. Advertising Campaigns (2) (See Mkt 144)****145A-B. Newspaper Advertising Procedures (2-2)**

Newspaper advertising; management of advertising department, production of copy, layouts, and servicing accounts.

146A-B. Field Work in Newspaper Advertising Procedures (2-2)

Practice in selling and servicing advertising accounts for newspapers with the college newspaper used as a laboratory. (2 lab, 2 field hours)

149. Public Opinion and Propaganda (3)

Use of propaganda to motivate public opinion on national and international levels in such areas as business, politics, and communities.

150. Media of Communication (3)

Motivation of large numbers of people through the control of such mass media as newspapers, magazines, motion pictures, radio and television.

181. Laws of Communication (2)

Libel, right of privacy, right of confidence, contempt by publications, property rights in manuscripts, infringement, copyright, postal laws.

190. Independent Study (1-3; max see reference)

See Regulations and Procedures—Independent Study.

198. Newspaper Practice (2-4; max total 4)

Prerequisite: permission of instructor. Internship on San Joaquin Valley newspapers and radio and television stations. Reports made regularly to instructor.

199. Newspaper Advertising Practice (2-4; max total 4)

Prerequisite: Jour 145A-B, 146A-B; permission of instructor. Internship in advertising departments of San Joaquin Valley newspapers. Reports made regularly to instructor.

NURSING DEPARTMENT

Professor: Gardner (Chairman)

Associate Professor: Bergey

Assistant Professors: Bailey, Baumgartner, Chang, M. Davis, Erickson, E. Greene, Haddad, Hansen, Hogan, Hymovich, Jenkin, Kay, Krell, Maxson, Monsen, M. Nelson, Nishio, Sia, Sommer, Stittich

The Nursing Department offers a bachelor of science degree with a major in nursing. Upon completion of the program 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 professional nurse. It also qualifies the graduate for the California certificate in public health nursing and provides a foundation for graduate study and advancement in the nursing profession. This program also provides an opportunity for the registered nurse to fulfill the requirements for the bachelor of science degree major in nursing.

The Nursing Department is 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 Fresno Community Hospital, St. Agnes Hospital, Fresno General Hospital, Valley Children's Hospital (Fresno), Veteran's Administration Hospital (Fresno), Kings View Hospital (Reedley), Fresno County Health Department, and Kern County Health Department (Bakersfield). These facilities are used for clinical nursing laboratory experience which is correlated with course content.

BACHELOR OF SCIENCE DEGREE WITH MAJOR IN NURSING

The bachelor of science degree curriculum consists of 130 units, 65 of which are in the nursing major. The general requirements for the bachelor of science degree must be completed (see *Degrees and Credentials*). Completion of certain lower division nursing courses will meet general education requirements in health education (see chairman of Nursing Department).

Students enrolled in the nursing major prior to the fall of 1965 who remain in continuous attendance will be permitted to continue the major course sequence as outlined in the 1964-65 General Catalog. These courses will be offered until students enrolled at that time would normally have completed them. Students enrolling in the fall of 1965 or later, or returning after an absence, must meet the major requirements as outlined (see chairman of Nursing Department).

	MAJOR	<i>Units</i>
Nurs 1, 16, 26		18
Nurs 111, 112, 114, 116, 120, 125, 126, 130, 135, 145		47
		—
		65

Additional Requirements: Bact 20, H Ec 31, Psych 111, 119, Chem 2A-B, Biol 66, Physio 1, Soc 1A, Biol 2A recommended.

Provision for Students Who Are Registered Nurses

Registered nurses who are applicants for the bachelor of science degree must have met admission standards of the college, must have graduated from an accredited school of nursing, must be legally entitled to practice nursing as an RN in the State of California, must have taken the NLN graduate examination either prior to admission or within the first year after enrollment, and must complete all requirements of the major in nursing. Credit by examination may be obtained for nursing and other courses up to the maximum of 30 units credit. Consult nursing advisers for further information on course requirements.

SUGGESTED SEQUENCE OF COURSES FOR BACHELOR OF SCIENCE DEGREE MAJOR IN NURSING

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 130 units must be completed for the bachelor of science degree. (See *Degrees and Credentials*)

- 1st Year: Nurs 1, Chem 2A-B, Psych 7, Biol 66, Soc 1A
 2nd Year: Nurs 16, 26, Bact 20, H Ec 31, Psych 119, Physio 1
 3rd Year: Nurs 111, 112, 114, 120, Psych 111
 4th Year: Nurs 116, 125, 126, 130, 135, 145

STANDARD DESIGNATED SERVICES CREDENTIAL WITH SPECIALIZATION IN HEALTH

(For this and other credential information see *School of Education and Nursing Department in the School of Professional Studies*)

Courses

NURSING

1. Introduction to Nursing (2)

Orients students to professional nursing, appreciation of its heritage, and functions of the professional nurse in relation to other members of the nursing team.

16. Fundamentals of Nursing (8) (Former Nurs 5)

Prerequisite: Biol 66, Chem 2A-B, Physio 1 (concurrently). Instruction and application of basic nursing principles to meet the needs of the adult patient. (4 lecture, 12 lab hours)

26. Medical-Surgical Nursing I (8)

Prerequisite: Nurs 16, H Ec 31, Bact 20 or concurrently. Basic concepts essential to medical-surgical nursing; care of patient and family; laboratory experience emphasizing patient-centered approach. (4 lecture, 12 lab hours)

111. Maternal-Child Nursing I (7)

Prerequisite: Nurs 26, Psych 119. Principles; teaching health; nursing care during maternity cycle, including neonatal; family unit and healthful family relationships. (3 lecture, 12 lab hours)

112. Maternal-Child Nursing II (7)

Prerequisite: Nurs 26, Psych 119. Nursing care of the developing child; family unit; relationship of illness to growth and development. (3 lecture, 12 lab hours)

114. Public Health Science (2)

Prerequisite: Nurs 111, 112, 120, 130 (concurrently). Trends in public health administration, organization, functions; national, state, local, public, voluntary agencies; interpretation and use of vital statistics; environmental health and epidemiology.

116. Trends in Nursing Education (2)

Prerequisite: Nurs 111, 112, 120. Influence of social, political, religious, health, and scientific movements on the progress of nursing; trends, problems and responsibilities of the professional nurse.

120. Psychiatric Nursing (7)

Prerequisite: Nurs 26. Mental disorders, the psychoses and psychoneuroses; causes, prevention, treatment, and total nursing care; social problems involved in modern concepts of mental illness. (2 lecture, 15 lab hours)

125. Seminar in Nursing (2)

Basic concepts of research as it relates to reading nursing studies; understanding problem-solving techniques.

126. Medical-Surgical Nursing II (7)

Prerequisite: Nurs 111, 112, 120, 145 (concurrently). Total patient care utilizing a problem-solving approach; laboratory experience in planning and directing nursing care for individuals and groups of patients. (2 lecture, 15 lab hours)

127. Principles of Teaching Nursing (2)

Prerequisite: Nurs 111, 112. The teaching-learning process; organization of instruction for the individual patient, auxiliary workers, community groups.

130. Public Health Nursing (8)

Prerequisite: Nurs 111, 112, 120, 114 (concurrently). Basic principles and practices of public health; responsibility of the public health nurse in community programs for health and social welfare. (3 lecture, 15 lab hours)

135. Legal Problems in Nursing Education (2)

Prerequisite: Nurs 111, 112, 120. The conduct, rights, and responsibilities of a professional nurse; analysis of the legal status, obligations, and liabilities of the nurse.

140. Disaster Nursing (2)

Responsibilities and functions of a professional nurse in common emergencies and mass disaster.

145. Principles of Administration in Nursing (3)

Prerequisite: Nurs 111, 112, 120, 126 (concurrently). Principles of nursing service administration; ward management and its place in the organization structure of the hospital; interpersonal relationships employing the team concept. (2 lecture, 3 lab hours)

150. School Nursing (8)

Prerequisite: Nurs 130. Role of the nurse in the school health program. (3 lecture, 15 lab hours)

190. Independent Study. (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

MINISTRY OF SOCIAL WORK

DEPARTMENT OF SOCIAL WORK

DIVISION OF SOCIAL WORK

Social Work	312
Social Welfare	313

DIVISION OF SOCIAL WORK

Thomas M. Brigham, Director

Professors: Brigham (Director), Hayes, Morrissey, Varley

Associate Professors: Emmal, Jenkins, Moss, Pickford, Rich

Assistant Professors: Bates, Ellis, M. Harrison, J. Kaufman, Kershaw

Field Instructors: Bardizian (FCDMH), Bonham (CYA), Fibel (FCPD), A. Hogan (CDSW), Takizawa (CDC), Wells (MCWD)

Part-time: Mahony, Ziering

The Division of Social Work provides an undergraduate major in social welfare leading to the bachelor of arts degree, designed to provide preparation for graduate work, to prepare for beginning positions in social work, and to provide a broad education in liberal arts. The division 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 sociology, political science, cultural anthropology, economics, and psychology. Graduate social work courses are similarly integrated and include materials from medicine, psychiatry, and law, as well. Additionally, graduate social work courses include content unique to social work, especially in methods, field instruction, and social welfare policy and services. The Division of Social Work holds both undergraduate and graduate membership in the Council of Social Work Education, and its two-year professional master of social work program is accredited by the Council.

COOPERATING AGENCIES

Several social agencies in the central San Joaquin Valley participate in the social welfare and social work training program by providing field experience and instruction at the undergraduate and graduate level. These include the North Avenue Community Center, Valley Children's Hospital Child Guidance Clinic, State Department of Corrections, Youth Authority, International Institute, American Red Cross, Veterans Administration Regional Office, Mental Health Association of Fresno, Fresno County Department of Public Welfare, Social Service Divisions of Agnews State Hospital, Atascadero State Hospital, Stockton State Hospital, and Porterville State Hospital, Kings County Schools, Bureau of Social Work of the State Department of Mental Hygiene, Fresno County Department of Mental Health Services, Paso Robles School for Boys, and Social Service Division of the United States Veterans' Administration Hospital. In addition, other agencies cooperate in the program.

BACHELOR OF ARTS DEGREE MAJOR IN SOCIAL WELFARE

	<i>Units</i>
Econ 1A-B, Anthro 2, Soc 1A	12
S Welf 20, 121, 124, 127, 181 (2 un)	14
Psych 66, 145, 152	9
Elect from: Anthro 104, Econ 150, Soc 152, 155, 157, 165, S Welf 122	6
Elect from: Crim 120, 132, Econ 180, Mkt 105, Soc 111, 153, 163	3
Elect from: Econ 131, Pol Sc 161, 163, 164A-B	3
Elect from: A Ed 153, Math 40, Psych 25	3
Elect from: Psych 111, 116, 117, 118, 119, 120, 123, 152F	3
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	53

MASTER OF SOCIAL WORK DEGREE

The master of social work degree prepares social workers for such areas as public assistance, child welfare, hospital social service, family service, child guidance, mental health, overseas social work, rehabilitative social work, social work in correctional programs. Emphasis at Fresno State College 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 closely supervised field instruction. Emphasis will be upon social casework with some orientation to social group work, community organization, and administration. All degree students will be required to complete an individual thesis or a group research project.

For further information, consult the division director. 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 (16 un): SW 200, 220, 230, 250 (3 un), 279, 291 (2 un).

2nd Semester (15 un): SW 201, 221, 230, 250 (5 un), 292 (1 un).

3rd Semester (15 un): SW 250 (10 un), 290, 297 or 299 (2 un).

4th Semester (13-16 un): SW 202, 222, 230 (2 un), 280 (2 un), 290 (1 un), 297 or 299 (2 un); optional elective.

Note: Credit for SW 291 and 292 is applied to the contract program.

Courses**SOCIAL WELFARE****20. Introduction to Social Welfare (3)**

Not open to freshmen or students with credit in Soc or S Welf 120. Prerequisite: Soc 1A or permission of instructor. Social, economic, political, historical, and philosophic components in development of social welfare and social work in western society.

121. Social Welfare Programs (3)

Prerequisite: Soc 1A 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.

122. Child Welfare (3)

Prerequisite: Soc 1A or permission of instructor. Recommended: Psych 119, S Welf 20, 121. Programs for physical, psychological, and social needs of children; institutions, foster homes, adoption, guidance clinics, protective and preventive services, services for handicapped; legislation.

124. Fundamentals of Interviewing (3)

Prerequisite: Soc 1A or permission of instructor. For social welfare, criminology, recreation, and education students. Principles and practice of interviewing in case work, group work, community organization, social research, correctional work, and related areas.

127. Group and Community Services (3)

Prerequisite: Soc 1A or permission of instructor. Group and community processes and social services to meet human needs.

180. Training in Public Service (1-2; max total 5)

Prerequisite: Soc 1A and permission of instructor. Planned and supervised experience or study in a field of occupational specialization.

181. Supervised Social Welfare Field Experience (1-2; max total 4)

Prerequisite: second semester junior standing; Soc 1A and permission of instructor. Observation, orientation and limited participation in operations of private or public social welfare agencies. (Minimum of 3 field hours per unit.)

SOCIAL WORK**GRADUATE COURSES**

Note: Admission to the MSW program is prerequisite to all graduate courses unless otherwise stated.

200. Social Welfare Policy and Services I (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. Social Welfare Policy and Services II (3)

Prerequisite: SW 200. 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. Social Welfare Policy and Services III (3)

Prerequisite: SW 201. Current social welfare policy and services; a comparative evaluation of United States and other world programs, policy and expectations with emphasis on philosophy, values and ethics; current social issues in relation to social function and social responsibility.

220. Human Behavior and Social Environment I (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. Human Behavior and Social Environment II (3)

Adaptive and maladaptive behavior under environmental stress; health and disease, role and cultural factors, and group processes as determinants of social functioning.

222. Human Behavior and Social Environment III (3)

Social pathology; epidemiology and prevention of deviant behavior.

230. Seminar in Methods of Social Work Practice (2-3; max total 9)

Three semesters in sequence: (1) introductory social casework and group work; (2) social casework and group work; (3) advanced social casework and introductory community organization.

250. Field Instruction (2-10; max total 18)

Supervised practice in social work methods; one placement each year of the graduate program.

272. Social Work in Rural Areas (2)

Prerequisite: permission of Director. The social worker's function with wide ranging problems and limited resources; problems of farm laborers, small farmers, isolation; utilization of appropriate techniques and methods.

273. Seminar in Correctional Social Work (2)

Prerequisite: permission of Director. Program, problems, analysis of social work services in correctional field.

274. Services for the Aging (2)

Prerequisite: permission of Director. Programs to meet the needs of the aging; income maintenance, health, living situation, use of leisure.

275. International Social Work (2)

Prerequisite: permission of Director. Problems and practices of social work outside of North America with emphasis on the application of social work knowledge, skills and practices in the developing parts of the world.

279. Community Development (2)

Prerequisite: permission of Director. Local self-help with aid of an outside agent; defining problems, assessing potential, encouraging local assumption of responsibility; using technical and specialized assistance.

280. Seminar in Social Work Supervision (2)

Prerequisite: permission of Director. Administrative and educational functions of supervision; staff development; evaluation.

281. Seminar in Group Services (2)

Prerequisite: permission of Director. Group work in group-serving programs and in other programs and agencies; recreational, informal educational, therapeutic, family service, children's services, correctional, and other settings.

285. Financing of Social Welfare Programs (2)

Prerequisite: permission of Director. Public and private agency financing; long-term and short-term budgeting; single and intergovernmental programs; independent and federated funding of voluntary agencies.

290. Independent Study (1-3; max see reference)

See *Regulations and Procedures—Independent Study*.

291. Social Work Research (2)

Relation of research, theory, and practice in social work.

292. Methods in Social Work Research (1)

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: SW 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. Work on group basis, standards same as thesis.

299. Thesis or Project (2-4; max total 4)

Prerequisite: SW 292. See *Master's Degrees—Thesis Requirement*. Preparation, completion, and submission of an acceptable thesis or project for the master's degree.

FACULTY, 1967-1968

Full-Time Faculty	319
Part-Time Faculty	348
Emeriti	354

FACULTY, 1966-1967

Note: Numbers in parentheses indicate year of appointment at Fresno State College.

- NESS, FREDERIC W. (1964), President; Professor of English
BA, Dickinson College; MA, University of Cincinnati; PhD, Yale University.
- ABOU-GHORRA, IBRAHIM (1956), Associate Professor of Psychology; Counselor (on sabbatical leave, spring)
BA, Cairo University; Diploma, Ain Shams University (Egypt); Diploma, Cairo Institute of Higher Studies; MA, Ohio State University; PhD, University of Southern California; Certified Psychologist.
- ADAMS, ROBERT C. (1965), Assistant Professor of Speech
BA, Idaho State College; MA, University of Oregon.
- AGNEW, ALLEN M. (1965), Assistant Professor of Office Administration
BA, MA, San Jose State College; EdD, University of California at Los Angeles.
- AIKEN, JOYCE B. (1956; Spring 1962), Assistant Professor of Art
BA, MA, Fresno State College.
- ALBRIGHT, W. DONALD (1958), Dean of Students
BS, Northeast Missouri State Teachers College; MEd, University of Missouri; EdD, Teachers College, Columbia University.
- ALDEN, H. LEE, JR. (1960), Assistant Professor of Speech
BA, University of Virginia.
- ALDRICH, BEVERLY J. (1957), Psychometrist
BA, University of Nebraska.
- ALDRICH, LESLIE L. (1955), Associate Professor of Industrial Arts and Technology
BA, Willamette University; MSA, Oregon State College.
- ALKIRE, G. DON (1953), Professor of Mathematics
BA, MA, University of South Dakota; EdD, University of Kansas.
- ALLEN, DERYLE K. (1961), Associate Dean of Students (Counseling and Testing) and Coordinator of Faculty Advising
BA, Southwestern State College (Oklahoma); MEd, EdD, University of Oklahoma.
- ALLEN, LUCILE (Spring 1967), Counselor
BA, Trinity University; MA, Southern Methodist University; EdD, Teachers College, Columbia University.
- ALTER, DONALD R. (1966), Lecturer in History
BS, University of Missouri; MA, Columbia University; PhD, University of Illinois.
- ANDERSON, DAVID C. (1966), Assistant Professor of Management and Accounting
BS, MS, West Virginia University.
- ANDERSON, MYRON M. (1937), Associate Professor of Physical Education
BA, Fresno State College; MA, University of Southern California.
- ANGELL, MELVIN A. (1956), Associate Dean of Students (Counseling and Testing) (on leave)
BA, MA, EdD, University of Washington; Certified Psychologist.
- ARCE, GINA (1957), Associate Professor of Botany
BA, MA, George Peabody College; PhD., Vanderbilt University.

- AUCHTER, EDMUND L. (1964), Assistant Professor of Economics
BS, Xavier University (Ohio); MA, Johns Hopkins University.
- AUSTIN, ELLIS T. (1958), Professor of Management and Marketing
BA, University of Washington; PhD, Michigan State University.
- AVENT, JON C. (1965), Assistant Professor of Geology
BA, University of Colorado; MS, PhD, University of Washington.
- AVERY, GEORGE E. (1959), Associate Professor of Education; Coordinator,
Operation Fair Chance
BS, Colorado State University; EdD, University of Maryland.
- BADDIN, MELVIN M. (1948), Associate Professor of Music
BM, MMus, Northwestern University.
- BAGDAZIAN, NAZALY (1966), Librarian II
BA, MALS, University of Wisconsin.
- BAILEY, EVA G. (November 1962), Assistant Professor of Nursing
BS, University of Arizona; MS, University of California at Los Angeles; Reg-
istered Nurse.
- BAKKEGARD, BENJAMIN M. (1958), Associate Professor of Music and Educa-
tion; Laboratory School Teacher
BS, University of North Dakota; MEd, University of Minnesota; EdD,
Teachers College, Columbia University.
- BALL, WILBUR P. (1958), Associate Professor of Agriculture and Education
BS, MEd, Colorado State University; PhD, Iowa State University.
- BALLOU, STEPHEN V. (1953), Professor of Education
BEd, Duluth State Teachers College; MA, EdD, University of Colorado.
- BARDIZIAN, GEORGIA T. (1964), Field Instructor in Social Work (FCDMH)
BA, Lake Erie College (Ohio); BS, MSW, Simmons College (Boston).
- BARNHART, KENNETH E., JR. (1958), Professor of Engineering
BS, MS, PhD, University of California.
- BATES, V. EDWARD (1965), Assistant Professor of Social Work
BS, Brigham Young University; MSW, University of Utah.
- BATHURST, LEONARD H., JR. (1954), Professor of Education; Director of
Instructional Media Center
BA, MEd, EdD, Pennsylvania State University.
- BAUMGARTNER, MARGARET M. (1963), Assistant Professor of Nursing
BS, San Francisco College for Women; MS, University of California at San
Francisco.
- BAUMWELL, KARL R. Major, USAF (1966), Assistant Professor of Aerospace
Studies
BA, DePaul University.
- BEACH, PHILIP F. (1964), Assistant Professor of Political Science
BA, University of Washington; MA, PhD, Northwestern University.
- BEARD, C. NOBLE (1937), Professor of Geology; Chairman, Geology Department
BA, MA, Indiana University; PhD, University of Illinois.
- BEATTY, HAROLD J. (1937), Professor of Physical Education (on sabbatical
leave, spring)
BA, Fresno State College; MA, University of California.
- BEATTY, WILLIAM C., JR. (1947), Professor of Social Science; Chairman, An-
thropology-Sociology Department (on sabbatical leave, spring)
BA, University of Denver; MA, University of Colorado; PhD, University of
Southern California.

- BEDROSIAN, SARAH G. (1957; 1962), Associate Professor of Finance and Quantitative Studies
BA, MA, Fresno State College; DBA, University of Southern California.
- BEDEN, J. PETER (1948), Associate Professor of Physical Education (on sabbatical leave, spring)
BA, University of Redlands.
- BELL, JESSE T. (Spring 1948), Principal Vocational Instructor in Agriculture; Chairman, Animal Science Department
BS, Texas College of Arts and Industries; MA, Sul Ross State Teachers College.
- BENNETT, BOB G. (Spring 1967), Lecturer in Physical Education
BA, Fresno State College.
- BENNETT, BOB L. (1955), Associate Professor of Music
BA, Fresno State College; MS, Juilliard School of Music; DMA, Stanford University.
- BENSON, BARRETT W. (1965), Assistant Professor of Chemistry
BA, Middlebury College; PhD., University of Vermont.
- BENSON, RAY (1964), Assistant Professor of Finance and Industry
BA, Long Island University; LLB, Fordham University; MBA, University of California at Los Angeles.
- BERDAHL, ARTHUR C. (1932), Professor of Music (on sabbatical leave, spring)
BA, Augustana College; MA, PhD, State University of Iowa.
- BERGEY, JOHN (1961), Associate Professor of Nursing
BS, Yankton College; MA, University of Pittsburgh; Registered Nurse.
- BERRY, SARA C. (1957), Librarian III, Laboratory School
BA, Occidental College.
- BEVILL, VINCENT D. (1957), Assistant Professor of Engineering
BS, Fresno State College; MS, University of California at Davis; Registered Mechanical Engineer.
- BIEHLER, WAYNE E. (1951), Principal Vocational Instructor in Agriculture; Chairman, Plant Science Department
BS, Fort Hays Kansas State College; MS, University of California at Davis.
- BIGGE, MORRIS L. (1950), Professor of Educational Foundations; Chairman, Advanced Studies Department (fall)
BA, Washburn Municipal University; MS, University of Michigan; PhD, University of Kansas.
- BIGGERSTAFF, WARREN R. (1948), Professor of Chemistry (on sabbatical leave, spring)
BA, Willamette University; MS, Oregon State College; PhD, University of Wisconsin.
- BILDERBACK, D. LOY (1962), Assistant Professor of History (on research-creative leave, spring)
BA, MA, University of Kansas; PhD, University of Washington.
- BILLINGS, ROBERT S. (1957), Associate Professor of English; Chairman, English Department
BA, University of New Hampshire; MA, Boston University; PhD, State University of Iowa.
- BIRD, C. WESLEY (1932), Professor of Foreign Languages
BA, MA, Oberlin College; Diplôme, Grenoble University; MA, PhD, Princeton University.

- BLACK, BYRON A., JR. (Spring 1967), Assistant Professor of English; Vietnam Leadership-Scholarship Program
BA, University of Texas.
- BLACKERBY, BRUCE A. (1963), Assistant Professor of Geology
BA, University of California at Riverside; PhD, University of California at Los Angeles.
- BLANTON RONALD L. (1965), Assistant 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, Colorado State College; EdD, Bradley University.
- BLOMGREN, GLEN H. (1962), Assistant Professor of Industrial Arts and Technology.
BA, MA, Fresno State College.
- BLOOD, KENNETH H. (1966), Counselor
BA, Hamline University; MS, PhD, Washington State University.
- BLUESTEIN, GENE (1963), Assistant Professor of English (on research-creative leave, spring)
BA, Brooklyn College; MA, PhD, University of Minnesota.
- BLUESTONE, SYDNEY (1963), Assistant Professor of Chemistry
BS, Brooklyn College; PhD, Rutgers University.
- BOARD, ROBERT R. (1964), Registrar
BS, University of Santa Clara.
- BOCKMAN, DAVID C. (1966), Assistant Professor of Industrial Arts and Technology
BA, MA, Fresno State College.
- BOHNSTEDT, JOHN W. (1956), Associate Professor of History (on sabbatical leave, fall)
BA, Michigan State University; MA, PhD, University of Minnesota.
- BONHAM, CLIFFORD V. (1964), Field Instructor in Social Work (CYA)
BA, MSW, University of California.
- BOOLSEN, FRANK M. (1948), Professor of Criminology; Chairman, Criminology Department
BA, MA, University of California.
- BOWEN, WAYNE S. (1964), Assistant Professor of Foreign Languages
BA, Ohio State University; MA, Emory University (Georgia); PhD, Ohio State University.
- BOWERS, BILLIE I. (1959), Laboratory School Teacher
BA, Fresno State College.
- BRASFIELD, CHARLES R. (1966), Counselor
BA, MA, University of Texas.
- BRAUN, O. MARTIN (1936), Principal Vocational Instructor in Agriculture
BS, MA, University of California.
- BREEN, THOMAS E. (1966), Assistant 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), Associate Professor of English
BA, Dana College; MA, University of Nebraska; PhD, University of Washington.
- BRENNINGER, RALPH A. (1946), Professor of Foreign Languages
BS, Lafayette College; MA, Columbia University; PhD, University of California.
- BREWER, DAVID L. (1964), Assistant Professor of Sociology
BS, Brigham Young University; MS, Purdue University; PhD, University of Utah.
- BREWER, RAY E. (1965), Assistant Financial Aids Coordinator
BS, Kansas State University; MA, New Mexico State University; EdD, University of Arizona.
- BRIGHAM, THOMAS M. (1953), Director, Social Work Division; Professor of Social Work
BA, San Francisco State College; MSW, University of California; Registered Social Worker (California).
- BROCK, RICHARD K. (1966), Assistant Professor of Management and Marketing
BA, MBA, University of Washington.
- BROOKS, WAYNE A. (1956), Associate Professor of Business Law
BA, St. Ambrose College; JD, University of Iowa; LLM, Stanford University; Member, Iowa Bar, California Bar.
- BROUWER, JAMES M. (1964), Assistant Professor of History
BA, MA, Yale University.
- BROWN, FORREST D. (1947), Professor of Educational Psychology
BS, MS, Fort Hays Kansas State College; PhD, University of Cincinnati; Diplomate in Counseling.
- BROWN, SHELDON J. (1956), Professor of Physics (on sabbatical leave, fall)
BA, PhD, University of California at Los Angeles.
- BRYON, ARTHUR J. (1939; 1947), Professor of Music (on sabbatical leave, spring)
Normal Degree; San Francisco Conservatory of Music; BA, Fresno State College; MA, University of California; DMA, University of Southern California.
- BRYON, JEANETTE P. (1956), Associate Professor of Speech (on leave, spring)
BA, University of Maine; MA, University of North Carolina.
- BUCKMAN, KARL E. (1942), Professor of Political Science; Chairman, Political Science Department
BA, Fresno State College; MA, Claremont Colleges.
- BURDICK, DONALD J. (1960), Assistant Professor of Biology
BA, San Jose State College; PhD, University of California.
- BURGESS, ROBERT C. (1947), Associate Professor of Physical Education
BA, Fresno State College; MS, University of Southern California.
- BURRISS, MERLYN D. (1947; 1953), Associate Professor of Speech
BA, Fresno State College; MA, University of California at Los Angeles.
- BURTNER, DALE C. (1958), Dean, School of Arts and Sciences; Professor of Chemistry
BA, Reed College; MS, PhD, University of Washington.
- BURTON, BENJAMIN B. (1958), Associate Professor of Psychology (on research-creative leave, spring)
BA, MA, PhD, University of Missouri; Certified Psychologist.

- BUTLER, DONALD (1966), Instructor in English
BA, Stanford University; MA, Fresno State College.
- BUSH, P. DALE (1961), Associate Professor of Economics
BA, MA, University of Denver; PhD, Claremont Graduate School.
- BUTTON, ALAN D. (1961), Associate Professor of Psychology
BS, MA, University of Oregon; PhD, Stanford University.
- BUTTRICK, DON F. (1964), Assistant Professor of History at Bakersfield Center
BA, MA, PhD, University of California.
- CADY, DOROTHY A. (1954), Laboratory School Teacher
BS, University of Minnesota; BA, MA, Fresno State College; Registered Nurse.
- CAMPBELL, HOWARD J. (1946), Professor of Speech
BS, North Texas State Teachers College; MA, Stanford University; EdD, University of California.
- CANALES, JOSE C. (1946), Professor of History; Chairman, History Department
BA, Manhattan College; MA, PhD, University of California.
- CARNERO, JUAN J. (1963), Assistant Professor of Foreign Languages
BA, Mexico City College; MA, Middlebury College (Vermont); PhD, University of Madrid (Spain).
- CARR, JOHN H. (1953), Associate Professor of Bacteriology
BS, Kansas State Teachers College; MS, PhD, Kansas State College.
- CARR, ROBERT A. (1952; 1957), Professor of Finance and Industry; Chairman, Finance and Industry Department
BA, MA, San Francisco State College; PhD, University of Southern California.
- CEHRS, CHARLES H. (1948; 1953), Professor of Engineering
BME, University of Akron; MS, Oregon State College; ME, University of California; Registered Mechanical Engineer.
- CHANEY, HOMER C., JR. (1959), Associate Professor of Social Science at Bakersfield Center
BA, Dartmouth College; MA, PhD, Stanford University.
- CHANG, HSU H. (1966), Assistant Professor of History
BA, National Taiwan University; MA, University of Missouri; MS, Florida State University; PhD, University of Wisconsin.
- CHANG, LILLIAN T. (1966), Assistant Professor of Nursing
BS, Peking Union Medical College; MPH, University of Michigan; MS, University of California Medical Center.
- CHITTICK, ROGER D. (1956), Associate Professor of English
BA, Butler University; MA, Washington State College; PhD, Stanford University.
- CHUTE, AARON H. (1966), Adjunct Professor of Management and Marketing
BA, University of Michigan; MA, PhD, Ohio State University.
- CIULA, RICHARD P. (Spring 1961), Associate Professor of Chemistry; Chairman, Chemistry Department
BA, Bowling Green State University; MS, University of California; PhD, University of Washington.
- CLARK, DAVID E. (1950; 1953), Professor of Chemistry (on leave)
BA, University of Redlands; MS, PhD, Stanford University.
- COBB, DONN R. (1966), Physician
BA, Fresno State College; MD, California College of Medicine.
- COBB, GWENDOLIN B. (1953), Professor of History
BA, MA, PhD, University of California.

- COE, WILLIAM C. (1966), Assistant Professor of Psychology
BS, University of California at Davis; PhD, University of California.
- COHEE, PADRAIC J. (1966), Assistant Professor of Foreign Languages
BA, MA, University of California at Los Angeles.
- COLE, CHESTER F. (1947), Professor of Geography; Chairman, Geography Department
BA, Eastern Washington College of Education; MA, University of Washington; PhD, University of Nebraska.
- COLEMAN, CECIL N. (April, 1959), Professor of Physical Education; Chairman, Physical Education Department; Athletic Director
BA, MA, Arizona State University.
- COLVER, A. WAYNE (1957), Professor of Philosophy (on sabbatical leave, spring)
BA, University of California at Los Angeles; MA, PhD, Harvard University.
- COMEGYS, ROBERT G. (1955), Associate Professor of History
BA, MA, University of Washington; PhD, Stanford University.
- COOPER, ARNOLD M. (1957), Associate Professor of Psychology
BA, San Francisco State College; MA, PhD, Claremont Graduate School; Certified Psychologist.
- CROSBY, JOHN A. (1956), Professor of Geography (on sabbatical leave, fall)
BS, University of Chicago; MA, PhD, University of Washington.
- CSERNA, EUGENE G. (Spring, 1959), Associate Professor of Geology (on sabbatical leave)
PhD, University of Sciences (Budapest, Hungary); MA, PhD, Columbia University.
- DANDROY, MAXIMA A. (Spring, 1956), Associate Professor of Education (on sabbatical leave, fall)
BSE, National Teachers College (Philippines); MA, Arellano University (Philippines); EdD, Stanford University.
- DAUBS, EDWIN H. (1963), Assistant Professor of Biology
BS, MS, PhD, University of Illinois.
- DAVIS, DONALD G., JR. (1964), Librarian II
BA, University of California at Los Angeles; MA, MLS, University of California.
- DAVIS, IRVING F., JR. (1960), Associate Professor of Finance and Industry
BS, University of California; MS, University of Illinois; PhD, University of California.
- DAVIS, MARTHA A. (1960), Assistant Professor of Nursing
BS, St. Louis University; MA, Teachers College, Columbia University; Registered Nurse.
- DAVIS, VIOLA A. (1955), Counselor (on sabbatical leave, spring)
BA, Pasadena College; MA, University of Southern California; PhD, Northwestern University.
- DELANEY, RICHARD W. (1965), Assistant Professor of Art
BA, MA, San Francisco State College.
- DELANEY, VERNE D. (1940), Professor of Music
BM, MA, University of Washington.
- DEMING, DONALD E. (1960), Associate Professor of Engineering
BS, Worcester Polytechnic Institute; MS, University of Connecticut.

- DEMPSTER, FRED E. (1951), Associate Professor of Music
BA, University of Omaha; MMus, Northwestern University.
- DeTAR, WILLIAM R. (1956), Intermediate Vocational Instructor in Agriculture
(on leave)
BS, MS, University of California (Davis).
- DETTINGER, DONALD J. (1947), Associate Professor of Industrial Arts and
Technology, and Education
BA, Chico State College; MS, Oregon State College.
- DEWS, JON R. (1965), Assistant Professor of Physics
BS, Fresno State College; PhD, University of California.
- DIENSTEIN, WILLIAM (1946), Professor of Social Science and Criminology
BA, Stanford University; MA, University of California; PhD, Stanford Uni-
versity.
- DIESTEL, GEORGE (1966), Instructor in Speech
BA, St. Mary's College.
- DODDS, JOHN P. (1964), Associate Professor of Finance and Industry
BS, MS, PhD, Iowa State University.
- DOMINICK, WAYNE P. (1964), Assistant Professor of Engineering
BSCE, Ohio Northern University; MSCE, New Mexico State University.
- DONALDSON, JOHN R. (1956), Associate Professor of Physics
BS, MA, Rice University; MS, PhD, Yale University.
- DONNELLY, KEVIN J. (1966), Assistant Professor of Physical Education and
Recreation
BS, California State College at Los Angeles; MS, San Francisco State College.
- DONOHUE, DONALD J. (1965), Assistant Professor of Mathematics
BS, Fresno State College; MS, PhD, University of Oregon.
- DOW, VIRGINIA M. (1961), Laboratory School Teacher
BA, MA, Fresno State College.
- DOWLER, LLOYD (1948), Dean, School of Agriculture, Principal Vocational
Instructor in Agriculture
BS, MS, University of Wyoming.
- DOYLE, KATHERINE E. (1937; 1965), Associate Professor of Physical Education
BA, Stanford University; MS, Wellesley College.
- DRUMMOND, HAROLD G. (1966), Assistant Professor of Accounting and
Quantitative Studies
BS, University of Colorado; MSBA, University of Denver.
- DUKE, JOHN H. (1946), Professor of Journalism; Acting Chairman, Journalism
Department (spring)
BJ, University of Texas; MA, PhD, University of Southern California.
- DUNNING, WILLIAM J. (1947), Professor of Industrial Arts and Technology
(on sabbatical leave, fall)
BS, Iowa State Teachers College; MS, Iowa State College; EdD, University of
North Dakota.
- DURANDO, MARY M. (1961), Laboratory School Teacher; USOF Research
Project
BA, St. Mary College (Kansas); MA, Fresno State College.
- ECHOLS, JAMES P. (1964), Assistant Professor of History
BA, College of Idaho; MA, University of California.

- EDWARDS, NATHAN A. (1956), Professor of Education at Bakersfield Center
BS, Iowa State College; MS, Drake University; PhD, State University of Iowa;
Certified Psychologist.
- EGENOLF, JOHN J. (1966), Assistant Professor of Finance and Industry
BA, MBA, University of Santa Clara.
- ELGORRIAGA, JOSE A. (1962), Associate Professor of Foreign Languages
BA, Fresno State College; MA, PhD, University of California at Los Angeles.
- ELIASON, AFTON Y. (1935), Professor of Physics (on sabbatical leave, spring)
BS, Utah State Agricultural College; MA, PhD, University of California.
- ELLIS, DAVID L. (1966), Assistant Professor of Social Work
BA, University of Oklahoma; MSW, University of California at Los Angeles.
- EMERSON, JOHN T. (1959), Associate Professor of Quantitative Studies; Director
of Computer Center
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), Associate Professor of Foreign Languages
PhD, University of Berlin.
- ERICKSON, I. LOUISE (Spring 1965), Assistant Professor of Nursing
BA, Fresno State College; MA, Teachers College, Columbia University.
- ERVIN, ROGER E. (1957), Professor of Geography
BA, MA, University of Washington; PhD, University of Florida.
- ESTES, GENE L. (1964), Assistant Professor of Physical Education
BS, MS, University of Oregon.
- EVANS, RALPH F. (1947), Professor of Education
BEd, Eastern Illinois State Teachers College; MA, PhD, State University of
Iowa.
- EVANS, RONALD L. (1963), Assistant Professor of Biology
BA, MA, University of Toronto; PhD, Stanford University.
- EVANS, THOMAS H. (1963), Dean, School of Engineering; Professor of Engi-
neering
BS, MSCE, California Institute of Technology; Registered Professional Engi-
neer.
- EVERWINE, PETER P. (1962), Assistant 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.
- FALK, DORIS F. (1946), Professor of Biology
BA, MA, PhD, University of California
- FALK, KARL L. (1938), Professor of Economics
BA, Stanford University; PhD, University of Berlin.
- FAST, PETER G. (1957), Associate Professor of Education
BA, Goshen College; MA, Ball State Teachers College; EdD, Indiana Uni-
versity.
- FEUCHES, CONRAD (1946), Associate Professor of Industrial Arts and Tech-
nology
BA, Fresno State College; MS, Oregon State College.
- FIBEL, BARRY (1966), Field Instructor in Social Work (FCPD)
BA, MSW, University of Washington.

- FIKES, JAMES A. (1955), Professor of Health Education
BS, Central State College (Oklahoma); MPH, MEd, PhD, Oklahoma University.
- FISHER, M. BRUCE (1941), Associate Vice President for Academic Planning; Professor of Psychology
BA, University of California; PhD, Yale University; Certified Psychologist.
- FISK, MCKEE (1948), Dean, School of Business; Professor of Business Administration
BA, Oklahoma City University; MA, University of Southern California; PhD, Yale University.
- FOIN, OWEN F., JR. (1942), Professor of Engineering
BA, Fresno State College; Registered Electrical Engineer.
- FONG, RAYMOND G. (1963), Assistant Professor of Speech
BA, Stanford University; MA, Sacramento State College.
- FOSTER, E. MERLE (1959), Associate Professor of Education at Bakersfield Center
BA, MA, Colorado State College; PhD, State University of Iowa
- FOSTER, HAGUE D. (1966), Assistant Professor of Philosophy; Acting Chairman, Philosophy Department (spring)
BA, PhD, University of Chicago.
- FRANCIS, RICHARD W. (1965), Assistant Professor of Physical Education
BA, San Jose State College; MA, Fresno State College.
- FRICKER, HENRY F. (1952), Professor of Health Education and Education; Chairman, Health Education Department
BA, Marshall College; MA, EdD, Stanford University.
- FULKERSON, WILLIAM M., JR. (1966), Assistant Professor of Speech
BA, William Jewell College; MA, Temple University.
- GADE, WARREN E. (1966), Assistant Professor of History
BS, University of San Francisco; MA, Stanford University.
- GAMMON, EDWARD R. (1966), Assistant Professor of English
BA, Reed College; MA, University of Oregon; PhD, Stanford University.
- GARDNER, FANNIE L. (1959), Professor of Nursing; Chairman, Nursing Department
BS, MEd, University of Houston; Registered Nurse.
- GATTEN, JOHN T. (1965), Assistant Professor of English
BA, MA, Michigan State University; MFA, University of Iowa.
- GAYLORD, EDWARD H. (1957), Associate Professor of Engineering
BS in EE, Colorado State University; MS in EE, University of Colorado; Registered Electrical Engineer.
- GEERDES, CLAYTON E. (1965), Assistant Professor of English
BA, MA, San Francisco State College.
- GERARD, MARIAN M. (1949), Laboratory School Teacher
BA, Mills College; MA, Fresno State College.
- GETZE, JAMES K. (1966), Assistant to Director of Community Relations
BA, University of California.
- GIGLIOTTI, HELEN J. (1966), Assistant Professor of Chemistry
BA, Vassar College; PhD, University of Michigan.
- GILBERT, WILLIAM R. (1955), Associate Professor of Education
BS, BS, MS, University of Illinois; PhD, University of Washington.

- GLEASON, KENNETH C. (1946), Associate Professor of Physical Education
BA, Fresno State College; MS, University of Southern California.
- GLENN, ROBERT B. (1966), American Council on Education Fellow in Academic Administration
BA, Western Michigan University; MA, PhD, University of Michigan.
- GLIM, ROBERT J. (1948), Principal Vocational Instructor in Agriculture; Acting Assistant to the Dean, School of Agriculture
BS, MEd, University of California (Davis)
- GOISHI, FRANK H. (1966), Assistant Professor of Industrial Arts and Technology.
BA, MA, Fresno State College.
- GONSER, MARTIN E. (1958), Assistant Professor of Industrial Arts and Technology
BS, MS, Kansas State Teachers College.
- GOODWIN, HERBERT M., JR. (1964), Assistant Professor of History
BA, MA, San Diego State College.
- GOTHE, ARTHUR G. (Spring 1965), Librarian II
BA, University of California at Santa Barbara; MLS, University of California.
- GRAHAM, BERNICE A. (1966), Instructor in Speech
BA, State University of Iowa.
- GRAHAM, GAYLORD O. (1957), Assistant Professor of Speech
BA, MA, State University of Iowa.
- GRAHAM, MARY E. (Spring 1965), Instructor in English
BEd, Western Illinois State Teachers College; MA, University of Illinois.
- GREEN, HAROLD E. (1966), Director of Community Relations
BSJ, Northwestern University.
- GREENE, ELEANOR R. (1960), Assistant Professor of Nursing
BA, Cornell University; MA, Columbia University; Registered Nurse.
- GREGORY, EDDIE J. (1965), Associate Professor of Physical Education
BS, Pepperdine College; MS, University of Southern California.
- GRIFFITHS, I. ACE (1959), Associate Professor of Education
BS, University of Idaho; MS, University of Arizona; EdD, Colorado State College; Certified Psychologist.
- GROSSMAN, JOEL S. (1965), Assistant Professor of Psychology
BA, University of Michigan; MS, PhD, Western Reserve University.
- GYSLER, RANDOLPH L. (1966), Assistant Professor of Industrial Arts and Technology
BS, MA, Kent State University.
- HADDAD, MARIE N. (1964), Assistant 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.
- HAGGBLADE, BERLE (1963), Assistant Professor of Office Administration
BA, State College of Iowa; MA, Colorado State College; EdD, University of California at Los Angeles.
- HAIMBACH, DAVID (1959), Professor of Education; Principal, Laboratory School
BSEd, EdM, Temple University; EdD, University of Florida.

- HAIRABEDIAN, ARA (1953), Associate Professor of Physical Education
BS, University of Southern California; MEd, Pennsylvania State College; EdD, Stanford University.
- HALPER, DONALD G. (1955), Professor of Management and Marketing;
Chairman, Management and Marketing Department
BA, MS, University of Illinois; PhD, Stanford University.
- HAMPTON, ROBERT E. (1956), Associate Professor of Management and Marketing
BBA, Golden Gate College; MA, Chico State College; EdD, Stanford University.
- HANFT, ROBERT M. (1965), Assistant Professor of Finance and Industry
BA, MBA, University of California; DBA, University of Washington.
- HANSEN, JULIA A. (1962), Assistant Professor of Nursing
BA, University of Redlands; BA, Stanford University; MN, University of Washington; Registered Nurse.
- HANZLICEK, CHARLES G. (1966), Assistant Professor of English
BA, University of Minnesota; MFA, University of Iowa.
- HARKINS, FRANCES H. (Spring 1967), Assistant Professor of Home Economics
BS, Indiana University (Pennsylvania).
- HARLAN, RONALD J. (1956), Librarian II
BA, Fresno State College; MLS, University of California.
- HARMON, WALLACE M. (1965), Assistant 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), Senior Vocational Instructor in Agriculture
BS, University of Michigan; MS, Michigan State College.
- HART, FRANCIS A. (1965), Assistant Professor of English
BA, Harvard University; MA, University of Utah.
- HASSON, ALLEN (1966), Assistant Professor of Education
BS, Brigham Young University; MA, PhD, Arizona State University.
- HAWBECKER, ALBERT C. (1946), Professor of Biology
BA, Fresno State College; MA, University of California; PhD, Oregon State College.
- HAYES, DOROTHY D. (1965), Professor of Social Work
BA, Oberlin College; LLB, John Marshall School of Law; MA, PhD, University of Minnesota.
- HENDERSON, WALLACE D. (1958), Administrative Assistant to the President;
Associate Professor of Speech
BA, Fresno State College.
- HENDRICKSON, MARY R. (1966), Assistant Professor of Home Economics
BS, University of Tennessee; MS, Oregon State University.
- HENFLING, PIYYLLIS B. (1940; 1952), Associate Professor of Education
BA, MA, Fresno State College.
- HIGGINS, FRANCIS V. (1958), Associate 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 Speech
BA, MA, University of Iowa; PhD, University of Wisconsin.

- HILLMAN, STEPHANIE (1958), Librarian III
BA, University of California at Los Angeles; MLS, University of California.
- HIXSON, FLOYD M. (1951), Principal Vocational Instructor in Agriculture
BS, Oklahoma State University; MS, PhD, Kansas State University.
- HODGENS, UNA S. (1966), Lecturer in Education
BS, University of Utah; MA, Columbia University.
- HOGAN, ANNE B. (1964), Field Instructor in Social Work (CDMH)
BA, Vassar College; MSW, University of Pennsylvania.
- HOGAN, HILDA M. (1964), Assistant Professor of Nursing
BS, MS, Boston University.
- HOLDER, WAYNE B. (1955), Associate Professor of Psychology
BA, MA, New Mexico State University; PhD, University of Missouri.
- HOLM-HANSEN, HARRIETT (Spring 1967), Assistant Professor of English
BA, Brown University.
- HOPKINS, JERRY D. (1964), Assistant Professor of English
BA, Indiana University.
- HOPPING, ANN (1963), Librarian II
BA, Fresno State College; MLS, University of California at Los Angeles
- HORRALL, IRIE F. (1966), Housing Coordinator
BS, MS, Indiana State College.
- HOWLAND, RUSSELL S. (1948), Professor of Music
BM, MMus., University of Illinois.
- HUFF, ARTHUR E. (1964), Assistant Professor of Music
BA, MA, San Jose State College.
- HUGHES, JOAN D. (1958), Associate Professor of Education at Bakersfield Center
BA, San Jose State College; MA, Stanford University; EdD, University of California.
- HUNT, MAURICE P. (1948), Professor of Educational Foundations
BS, MA, PhD, Ohio State University.
- HUPPRICH, MABEL (1944), Associate Professor of Physical Education
BS, MS, University of Wisconsin.
- HYMOVICH, DEBRA P. (1964), Assistant Professor of Nursing
BS, Skidmore College; MA, Teachers College, Columbia University.
- ILG, GEORGE F. (1948), Assistant to the Dean, School of Agriculture; Project Director, Peace Corps; Principal Vocational Instructor in Agriculture
BS, University of California; MS, Ohio State University.
- IRWIN, PHYLLIS A. (1963), Assistant Professor of Music
BS, MEd, University of Houston; EdD, Columbia University.
- JACOBSEN, ERLAND L. (1959), Librarian III
BA, Stanford University; MLS, University of California.
- JARRETT, McRAE (1957), Associate Professor of Engineering
BS in EE, MS, University of Tennessee.
- JASUTIS, CORDELLIA (1959), Assistant Professor of Foreign Languages
Lic-es-Let, University of Paris; MA, PhD, State University of Iowa.
- JENKIN, SHIRLEY A. (1963), Assistant Professor of Nursing
BSN, Washington State University; MN, University of Washington; Registered Nurse.
- JENKINS, JACK T. (1961; 1964), Associate Professor of Social Work
BSSW, University of Arkansas; MSSW, University of Tennessee.

- JENNINGS, WILMAR A., JR. (1966), Assistant Professor of Psychology
BA, Brown University; MA, University of Portland.
- JENSEN, CLARENCE D. (1947), Principal Vocational Instructor in Agriculture;
Chairman, Agricultural Mechanics Department
BA, Chico State College; MS, Oregon State College.
- JEPSEN, VICTOR L. (1946), Professor of Management and Marketing
BA, MA, University of Oregon; EdD, Stanford University.
- JOHNSON, ALAN H. (1963), 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), Assistant Professor of Education
BS, MS, Oregon College of Education; EdS, Stanford University; EdD, Uni-
versity of Oregon.
- JOHNSON, RAYMOND W. (1965), Assistant Professor of Management and
Marketing
BS, University of California; MBA, University of Washington.
- 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), Associate Dean of Students (Admissions-Records)
BA, San Diego State College; MA, PhD, Claremont Colleges.
- JONES, JAMES P. (1966), Intermediate Vocational Instructor in Plant Science
BS, Mississippi State College; MS, PhD, University of Arizona.
- JULIANA, JOSEPH R. (1958) Associate Professor of Physical Education and
Recreation (on sabbatical leave)
BS, Temple University; MEd, University of Pittsburgh.
- KALLAM, JOHN F. (1962), Assistant Professor of Criminology
BA, San Jose State College; MS, Fresno State College.
- KALLENBERG, RUTH A. (1965), Librarian II
BA, Whitman College; MA, Indiana University.
- KALLO, ROBERT M. (1950), Professor of Chemistry
BS, PhD, University of California.
- KARLE, HARRY P. (1962), Senior Vocational Instructor in Agriculture
BS, Fresno State College; MS, PhD, University of California (Davis).
- KARR, HAROLD S. (1966), Assistant 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.
- KAUFMAN, JACK (1965), Assistant Professor of Social Welfare
BA, University of Chicago; MSW, University of Minnesota.
- KAUSCH, DONALD E. (1965), Assistant Professor of English
BA, Wayne State University; MA, University of Michigan; PhD, Wayne
State University.
- KAY, JEAN A. (1966), Assistant Professor of Nursing
Nursing Diploma, Presbyterian Hospital (Philadelphia); SCM, Royal Ma-
ternity Hospital (Glasgow); BSPH, MPH, Columbia University.
- KELLER, JEAN (1966), Instructor in Physical Education
BA, Fresno State College.

- KELLOGG, GARY B. (1961), Librarian III
BA, University of Colorado; MA, University of Denver.
- KENNEDY, CELESTE K. (1965), Assistant Professor of Physical Education
BS, Washington University; MA, Humboldt State College.
- KENSEL, WILLIAM H. (1965), Assistant Professor of History
BA, University of Washington; BA, MEd, Central Washington State College;
PhD, Washington State University.
- KENYON, ROBERT A., II (1966), Assistant Professor of Sociology
BA, Colorado University; MA, Oklahoma University.
- KERSHAW, JOYCE (Spring 1967), Assistant Professor of Social Work
BA, Fresno State College; MSW, University of California at Los Angeles.
- KIEFFER, GEORGE H. (1966), Assistant Professor of Biology
BS, Concordia College; MS, University of Colorado; PhD, University of
Arizona.
- KIMBERLY, MAX E. (1958), Associate Professor of Health Education (on
sabbatical leave, fall)
BS, MS, Montana State College; MA, EdD, Stanford University.
- KINDER, RICHARD J., Captain USAF (1966), Assistant Professor of Aerospace
Studies
BGE, University of Omaha.
- KINZEL, PAUL F. (1963), Resident Director, CSC International Programs; As-
sistant Professor of Foreign Languages
BA, Fresno State College; MA, Columbia University; PhD, University of
Washington.
- KIPPS, THOMAS C. (1956), Associate Professor of Mathematics; Chairman,
Mathematics Department
BA, MA, PhD, University of California.
- KIRTLEY, DONALD D. (1966), Assistant Professor of Psychology
BA, MA, PhD, University of Miami.
- KISSICK, ELENA F. (1966), Assistant Professor of Home Economics
BS, University of California at Davis; MA, San Jose State College.
- KLASSEN, PETER J. (1966), Assistant Professor of History
BA, University of British Columbia; MA, PhD, University of Southern Cali-
fornia.
- KNAUPP, SHIRLEY J. (1966), Assistant Professor of Education
BS, Oregon State University; MEd, University of Illinois.
- KNUDSEN, ROBERT G. (1964), Assistant to the Dean of Students; Coordinator,
Foreign Student Program
BS, MS, Utah State University.
- KOLSTAD, WILLIAM A. (1964), Assistant Professor of Political Science
BA, Macalester College; LLB, University of Minnesota; MA, University of
South Dakota; PhD, University of Texas.
- KRELL, FRED C. (1963), Assistant Professor of Nursing
BSN, State University of Iowa; MS, Boston University; Registered Nurse.
- KREMEN, BENJAMIN G. (1950), Professor of Education
BS, Johns Hopkins; MA, University of Maryland; PhD, Michigan State Col-
lege.
- KRUGER, JOHN H. JR. (1964), Assistant Professor of Management and Mar-
keting
BME, MA, PhD, University of Minnesota.

- KUEHN, MARY A. (1966), Assistant Professor of Home Economics
BS, Iowa State University.
- KULHAN, EDWARD F. (1956) Associate Professor of Engineering
BS, University of Nevada; MS, Pennsylvania State University; Registered
Land Surveyor.
- KUSEL, HEINZ N. (1965), Assistant Professor of Art
BS, Skidmore College; MA, Fresno State College.
- LABARRE, ANTHONY E., JR. (1961), Professor of Mathematics
BE, MS, Tulane University; PhD, University of Oklahoma.
- LAMBERT, HAZEL M. (1955), Associate Professor of Education
BA, College of St. Scholastica; BEd, Superior State College; MA, University
of Minnesota; PhD, University of North Carolina.
- LANDRUM, ELIZABETH A. (1932), Librarian III
BA, Fresno State College; MA, University of California.
- LARRABEE, CARLTON H. (1947), Professor of English
BA, Clark University; MA, Harvard University; EdD, New York University.
- LATIMER, HOWARD L. (1958), Associate Professor of Biology (on sabbatical
leave, spring)
BS, MS, State College of Washington; PhD, Claremont Colleges.
- LAURY, FRANK B. (1959) Associate Professor of Art; Chairman, Art Depart-
ment
BA, Iowa State Teachers College; MA, Stanford University.
BS, MS, University of California.
- LEAVENWORTH, RUSSELL E. (1955), Professor of English; Assistant to the
Dean, School of Arts and Sciences
BA, Hanover College; MA, PhD, University of Colorado.
- LEAVITT, GEORGE S. (1955), Professor of Psychology
BA, Macalester College; MA, PhD, University of California; Certified Psy-
chologist.
- LEE, ROBERT E. (1964), Assistant Professor of Geography
BA, MA, San Jose State College; PhD, University of California at Los
Angeles.
- LEE, YONG H. (1965), Assistant Professor of Foreign Languages
BA, Seoul National University; MA, University of Miami.
- LESLIE, GLENN F. (1958), Professor of Education; Chairman, Elementary Edu-
cation Department
BS, Central Missouri State College; MEd, EdD, University of Missouri.
- LEVALLEY, W. I. LOUIS (1954), Senior Vocational Instructor in Agriculture
BA, Eugene Bible University; BS, MEd, University of California (Davis).
- LEVIN, CARL (1942), Business Manager
BA, Fresno State College.
- LEVINE, PHILIP (1958), Associate Professor of English
BA, MA, Wayne University; MFA, State University of Iowa.
- LEWIS, KENNETH E. (1956), Coordinator of Financial Aids
BA, MA, Fresno State College.
- LEWIS, LETA J. (1963), Assistant Professor of Foreign Languages
BA, University of Washington; PhD, University of California at Los Angeles.
- LIAO, SAMUEL Y. (1965), Assistant Professor of Engineering (on leave, spring)
BS, University of Chicago; MSEE, University of Idaho.

- LINDLY, EDITH R. (1948), Professor of Health Education
BS, MS, Oklahoma State University; MPH, University of Michigan; EdD,
Oklahoma State University.
- LINDQUIST, STANLEY E. (1953), Professor of Psychology; Chairman, Psychology Department
BA, Fresno State College; PhD, University of Chicago; Certified Psychologist.
- LISKEY, NATHAN E. (1965), Assistant Professor of Health Education
BA, LaVerne College; MS, Indiana University.
- LIST, EDGAR A. (1961), Associate Professor of Foreign Languages; Chairman, Foreign Language Department
BA, Carroll College; MA, PhD, Yale University.
- LIVINGSTON, WILLIAM H. (1966), Assistant Professor of Industrial Arts and Technology
BS, University of California.
- LOCKWOOD, WILLIAM E. (Spring 1967), Lecturer in Journalism
BA, Stanford University.
- LOGAN, BARRY L. (1961), Assistant Professor of English
BA, MA, Syracuse University; PhD, Yale University.
- LOGANBILL, G. BRUCE (1966), Assistant Professor of Speech
BA, Bethel College; MA, University of Kansas; PhD, Michigan State University.
- LOMBARD, EDWIN H. (1947), Professor of Speech
BA, Oberlin College; MA, Columbia University; MA, PhD, Cornell University.
- LORING, JANET (1957), Associate Professor of Speech
BS, Northwestern University; MA, University of Kansas City; PhD, State University of Iowa.
- LOWERY, CHARLOTTE M. (1964), Librarian II
BSLS, Western Reserve University (Ohio); MA, University of Southern California.
- LUND, EDWARD O., JR. (1966), Assistant Professor of Art
BS, University of Wisconsin; MFA, Indiana University.
- LUNDBERG, JAMES B. (1960), Assistant Professor of Education
BS, North Texas State College; MA, Michigan State University.
- LYON, EARL D. (1938), Professor of English
BA, University of California at Los Angeles; MA, PhD, University of California.
- MACH, LELAND E. (1958), Associate Professor of Education
BA, Colorado State College of Education; MA, Northwestern University; EdD, College of the Pacific; Certified Psychologist.
- MACK, SEYMOUR (1957), Associate Professor of Geology
BS, College of the City of New York; MS, PhD, Syracuse University.
- MADDEN, HARRISON E. (1956), Associate Professor of Psychology
BS, MA, MA, PhD, University of Kansas, Certified Psychologist.
- MADDEN, HENRY M. (1949), College Librarian
BA, Stanford University; BLS, University of California; MA, PhD, Columbia University.
- MARGOSIAN, ARTHUR H. (1956; 1961), Associate Professor of Journalism
BA, MA, Fresno State College.

- MARK, ALBYN K. (1966), Assistant Professor of Anthropology
BA, MA, University of Arizona.
- MARTIN, HOWARD J. (1965), Intermediate Vocational Instructor in Agricultural Mechanics
BSAE, California State Polytechnic College.
- MARTIN, JOHN E. (1959), Associate Professor of Education
BA, Central State College (Oklahoma); MEd, EdD, University of Oklahoma.
- MARTIN, JOHN H. (1962), Assistant Professor of Music
BS, MA, Ohio State University; EdD, University of Arizona.
- MASON, R. ELAINE (1956), Associate Professor of Physical Education
BA, Fresno State College; MA, Stanford University.
- MATHERS, ROBERT L. (1959), Associate Professor of Philosophy; Chairman, Philosophy Department (on sabbatical leave, spring)
BA, University of California at Santa Barbara; PhD, University of California at Los Angeles.
- MATTHEW, VIRGIL L., JR. (1948), Assistant Professor of History
BA, Fresno State College; MA, University of California at Los Angeles.
- MAUGHELLI, MARY L. (1962), Assistant Professor of Art
BA, MA, University of California.
- MAXSON, DOROTHY E. (1958, 1965), Assistant Professor of Nursing
BS, San Francisco College for Women; MS, University of Colorado; Registered Nurse.
- McCLINTIC, J. ROBERT (1954), Associate Professor of Biology
BA, San Diego State College; PhD, University of California.
- McCOMAS, WAYNE L. (1953), Associate Professor of Industrial Arts and Technology
BA, Santa Barbara College; MA, Stanford University.
- McCONNELL, VANCE Y. (1966), Assistant Professor of Foreign Languages
BA, University of Omaha; MA, PhD, University of Arizona.
- McCOY, RALPH W. (1946, spring 1967), Professor of Biology (deceased)
BA, MA, PhD, Indiana University.
- McDOUGALL, THOMAS (1966), Assistant Professor of Art
BA, San Jose State College; MA, San Fernando Valley State College.
- McGEE, N. W. (1966), Lecturer in Sociology; Acting Chairman, Anthropology-Sociology Department (spring)
BA, Iowa State; MA, PhD, University of Iowa.
- McGUIRE, PAUL J. (1966), Coordinator of Academic Administration; Lecturer in Speech
BA, MA, San Fernando Valley State College.
- McKNIGHT, H. RAY (1965), Assistant Professor of English
BA, Harvard College; MA, PhD, University of North Carolina.
- MEEKER, MURIEL (1950), Laboratory School Teacher
BA, San Francisco State College; MA, Fresno State College.
- MERKLEY, PAUL C. (1964), Assistant Professor of History
BA, MA, PhD, University of Toronto.
- MEYER, RONALD W. (1966), Assistant Professor of Biology
BS, MA, University of Missouri; PhD, University of California.
- MEZEY, ROBERT (Spring 1967), Assistant Professor of English
BA, University of Iowa.

- MICCICHE, PAULINE F. (1966), Librarian II
BA, University of Buffalo; MS, Canisius College; MSLS, Western Reserve University.
- MILLER, CARL E. (1961), Assistant Professor of Education at Bakersfield Center
BS, Anderson College (Indiana); MA Eastern New Mexico University; EdD, Texas Technological College.
- MILLER, WILLIAM M. (1956), Associate Professor of Chemistry
BS, University of Illinois; MS, PhD, State University of Iowa.
- MINICH, MARSHALL E. (1966), Lecturer in Finance and Industry
BS, Lafayette College; MBA, Harvard Business School.
- MINICK, ROBERT A., JR. (1962), Assistant Professor of Economics
BS, MS, North Texas State College.
- MINSCHREW, WILLIAM E., JR. (Spring 1963), Assistant Professor of Art
BS, Atlantic Christian College; MFA, University of North Carolina.
- MITCHELL, JOHN D. (1965), Assistant Professor of Accounting and Quantitative Studies
BS, Fresno State College; MBA, University of California at Los Angeles; Certified Public Accountant.
- MOERK, ERNST (1967), Assistant Professor of Psychology
PhD, University of Innsbruck.
- MOLEN, DAYLE H. (1965), Assistant Professor of Journalism
BA, University of Idaho; MS, University of Oregon.
- MONSEN, CAROL L. (1966), Assistant Professor of Nursing
BS, Boston University.
- MONTGOMERY, RICHARD C. (1966), Professor of Geography
BS, University of Idaho; MA, PhD, University of Nebraska.
- MONTGOMERY, SHARON B. (Spring 1967), Lecturer in Philosophy
BA, MA, University of Pennsylvania.
- MOORE, HEYWARD, JR. (1965), Assistant Professor of Political Science
BA, University of North Carolina; MA, University of Florida; PhD, University of North Carolina.
- MORRISSEY, JAMES R. (1966), Professor of Social Work
BA, New England College; MSSS, Boston University; DSW, University of Southern California.
- MOSS, STANLEY S. (1965), Associate Professor of Social Work
BSS, College of City of New York; MSW, Rutgers, The State University.
- MULLENNIX, GRADY L. (1958), Professor of Economics
BS, MS, North Texas State College; PhD, University of Texas.
- MURPHY, JOSEPH B. (1949), Professor of Education
BS, Brigham Young University; MS, University of Utah; EdD, Stanford University.
- MUSICK, JAMES E. (1965), Assistant Professor of Industrial Arts and Technology
BA, MA, Long Beach State College.
- MUSSELMAN, DARWIN B. (1953), Professor of Art (on sabbatical leave, spring)
BA, Fresno State College; MFA, California College of Arts and Crafts; MA, University of California.
- MYERS, WILLIAM R. (1966), Building Coordinator
BS, Fresno State College.

- NAGY, ELEMER J. (1960; 1962), Associate Professor of Foreign Languages
MA, PhD, P. Pazmany University (Budapest).
- NALBANDIAN, LOUISE (1963), Assistant Professor of History
BA, San Francisco State College; MA, PhD, Stanford University.
- NASSE, GEORGE N. (1965), Assistant Professor of Geography
BA, Clark University; MA, PhD, University of Michigan.
- NATHARIUS, DAVID T. (1966), Assistant Professor of Speech
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, DON D. (Spring 1964), Intermediate Vocational Instructor in Agriculture
BS, Fresno State College; MS, University of California at Davis.
- NELSON, MYRTHEL S. (1965), Assistant Professor of Nursing
BA, College of Great Halls; MA, Gallaudet College; MA, Columbia University;
MN, Yale University.
- NEWCOMB, RICHARD F. (Spring 1956), Associate Professor of Industrial Arts
and Technology
BA, MA, Fresno State College.
- NEWSOME, RATANA (1961), Associate Professor of Home Economics; Chair-
man, Home Economics Department
BA, Chulalongkorn University (Thailand); MS, PhD, Florida State University.
- NEWTON, JAMES B., JR. (1966), Assistant Professor of Speech
BFA, University of Texas; MFA, Yale University.
- NICKLETT, GEORGIA E. (1965), Assistant Professor of Music
BA, University of California at Los Angeles; MA, EdD, Columbia University.
- NISHIO, KAREN H. (1959; 1963), Assistant Professor of Nursing
BS, University of Dayton; MS, University of California at Los Angeles;
Registered Nurse.
- NIXON, ARNE J. (1961), Director of Extension; Associate Professor of Edu-
cation
BS, Ellendale State Teachers College (North Dakota); EdD, Western Wash-
ington College of Education; EdP, Teachers College, Columbia University.
- NORSWORTHY, STANLEY F. (1966), Assistant Professor of Geography
BA, University of California at Los Angeles; MA, Miami University.
- NORTON, RICHARD (1963), Intermediate Vocational Instructor in Agri-
culture
BA, Fresno State College.
- O'BRIEN, JOHN C. (1965), Assistant Professor of Finance and Industry
BCom, University of London; MA, PhD, University of Notre Dame.
- ODEN, LYNN E. (1966), Assistant Professor of Physics
BA, Occidental College; MS, University of Idaho.
- OGDEN, LOWELL K. (1958), Assistant Professor of Education at Bakersfield
Center
BS, Arkansas State Teachers College; MA, University of Wyoming.
- O'NEIL, ROBERT M. (1957), Associate Professor of English
BA, MA, Montana State University; PhD, University of Washington.
- OPPER, S. MICHAEL (1965), Assistant Professor of Art
BS, Southern Connecticut State College; M.A., Columbia University.

- PAGE, R. WAYNE (1962), Assistant Professor of Speech (on leave)
BS, University of Utah; MS, Brigham Young University; PhD, Purdue University.
- PAGE, WILLIE E. (1964), Assistant Professor of English
BA, East Carolina College; MA, Florida State University.
- PAOLETTI, LYNNE (1965), Instructor in Speech
BS, Utah State University.
- PAPE, LAURENCE A. (1951), Professor of Physical Education
BA, MA, Ohio State University; EdD, Columbia University.
- PARKER, LILLIE A. (1951), Librarian IV
BA, BLS, University of California.
- PARKER, WILLIAM M. (1950), Associate Professor of Accounting
BS, MBA, University of California; PhD, University of Southern California;
Certified Public Accountant.
- PAUL, RICHARD W. (1966), Assistant Professor of Philosophy
BA, Northern Illinois University; MA, University of California at Santa Barbara.
- PELLA, CARMEN (1963), Assistant Professor of Foreign Languages
MA, University of Michigan; Dr. Ped., University de la Habana.
- PETERSON, REX M. (1966), Lecturer in Geography at Bakersfield
BS, MS, PhD, University of Michigan.
- PETRUCCI, VINCENT E. (1948), Principal Vocational Instructor in Agriculture
BS, MS, University of California at Davis.
- PFLUEGER, CLAYTON C. (1959), Senior Vocational Instructor in Agriculture
BS, South Dakota State College; MS, State College of Washington.
- PHILLIPS, MARGUERITE L. (1965), Assistant Professor of Social Work
BA, Fresno State College; MSW, University of California at Los Angeles.
- PICKFORD, PATRICIA R. (Spring 1957), Associate Professor of Social Work
BA, Fresno State College; MSW, University of California at Los Angeles.
- PIEPER, W. ALAN (1963), Assistant Professor of Psychology (on leave)
BA, MA, Fresno State College; PhD, University of Missouri.
- PIERSON, ALVIN P. (1941), Professor of Finance and Industry
BA, University of Nevada; MA, University of Florida; EdD, Stanford University.
- PIGG, C. JOANNE (1964), Assistant Professor of Biology
BA, Arizona State University; MS, PhD, Oregon State University.
- PITT, JACK A. (1957), Associate Professor of Philosophy
BS, Sir George Williams College (Canada); BA, MA, McGill University (Canada); PhD, Yale University.
- PLAFKIN, EDWARD L. (1966), Assistant Professor of Political Science
BA, Brandeis University; MA, PhD, University of California.
- POLLOCK, WILLIAM G. (1960), Admissions Officer
BA, MA, Colorado State College.
- POOLE, PATRICK H. (1966), Assistant Professor of Education
BA, University of Tulsa; MS, Kansas State College.
- PORCH, LOUISE W. (1942), Professor of Home Economics
BS, Rockford College; MA, Columbia University; EdD, Stanford University.
- POSEY, CLYDE L. (1966), Assistant Professor of Accounting and Quantitative Studies
BBA, Texas Western College; MBA, University of Texas; CPA, Texas.

- POSS, STANLEY H. (1956), Associate Professor of English
BA, University of Redlands; MA, Claremont Graduate School; PhD, University of Washington.
- POSTON, BILLIE L. (1966), Instructor in Physical Education
BS, MS, University of Tennessee.
- POWELL, FRANK V. (1955), Professor of Psychology
BA, University of Redlands; MS, PhD, University of Wisconsin; Certified Psychologist.
- POYTHRESS, RANSOM H. (Spring 1962), Assistant Professor of Foreign Languages
BA, Stanford University; MA, Fresno State College.
- PRONIN, ALEXANDER (1965), Assistant Professor of Foreign Languages
BA, University of California; PhD, Georgetown University.
- PROVOST, DAVID H. (1958), Associate Professor of Political Science (on sabbatical leave, spring)
BA, Pomona College; PhD, University of Queensland (Australia).
- QUIBELL, EDITH M. (1947), Librarian II
BA, Pomona College.
- RANDALL, CHARLES H. (1962), Assistant Professor of Speech (on research-creative leave, spring)
BA, Central Washington College of Education; MFA, Yale University.
- RANDOLPH, HELEN L. (1963), Assistant Professor of Elementary Education (on leave)
BA, MEd, University of Portland.
- REA, RALPH C. (1954), Professor of Music; Chairman, Music Department
BM, Eastman School of Music; MA, PhD, State University of Iowa.
- REA, THELMA M. (1958), Associate Professor of Education
BS, MS, University of Idaho; EdD, Stanford University.
- REES, BRYANT E. (1947), Professor of Biology
BA, MA, University of Utah; PhD, Stanford University.
- REHART, B. SCHYLER, JR. (Spring 1963), Instructor in Journalism
BA, MA, Fresno State College.
- REIGHARD, EDWARD (Spring, 1960), Associate Professor of Management and Marketing
BA, Middlebury College; BD, Yale University; MBA, PhD, Stanford University.
- REITMAN, SANDFORD W. (1966), Assistant Professor of Education
BA, Ohio University; MA, Western Reserve University.
- RICH, WALLACE N. (1963), Associate Professor of Social Work
BA, Fresno State College; MSW, Florida State University.
- RICHARDS, HERBERT D. (1955), Associate Professor of Engineering
BS, University of California; MS, Stanford University; Registered Civil and Structural Engineer.
- RIES, JOACHIM S. (1964), Assistant Professor of English
BA, Syracuse University; MA, PhD, University of Washington.
- RIPPEY, ANDREW D. (1946), Professor of Education
BS, MA, University of Florida; PhD, Ohio State University.
- RIBINSON, ETHEL A. (1946; 1950), Assistant Professor of Mathematics
BA, MA, Stanford University.

- ROCKWELL, JAMES H. (1957), Associate Professor of Industrial Arts and Technology
BS, Stout Institute; MS, Bradley University.
- ROHRER, HELEN F. (1933), Professor of Office Administration and Business Education; Chairman, Department of Office Administration
BA, MA, Stanford University.
- ROHRER, MARTHA D. (1958), Assistant Professor of Home Economics
BA, San Jose State College; MS, Oregon State College.
- ROGERS, DARRYL D. (Spring 1966), Lecturer in Physical Education
BA, University of Denver; MA, Fresno State College.
- ROSE, CARLENE (1951), Associate Professor of Home Economics
BS, University of Minnesota; MS, Oregon State College.
- ROSENTHAL, PAUL L. (1966), Assistant Professor of Mathematics
BA, MA, University of California; PhD, Oregon State University.
- ROTH, LESTER J. (1956), Director, Operation Fair Chance; Associate Professor of Social Science and Education
BS, Kent State University; MA, Western Reserve University; EdD, Stanford University.
- ROUSEK, EDWIN J. (1948), Principal Vocational Instructor in Agriculture
BS, University of Nebraska; MS, Cornell University.
- RUSSELL, KENNETH H. (1963), Assistant Professor of Chemistry
BS, Portland State College; PhD, Washington State University.
- SALGADO, RALPH H., JR. (1965), Instructor in Speech
BA, MA, University of Arizona.
- SANT'AGATA, CHARLES (1966), Activities Adviser
BA, Fresno State College.
- SASSER, LYLE B. (Spring 1967), Intermediate Vocational Instructor in Animal Science
BS, University of Idaho; MS, Colorado State University.
- SCARBORO, LOIS M. (1961), Librarian II
BA, University of California.
- SCHAUDT, EUNICE M. (1965), Assistant Professor of Home Economics
BS, University of Illinois; MA, Michigan State University.
- SCHMIDT, THEODORE (1966), Instructor in Physical Education
BA, Idaho State University.
- SCHMITT, GERHARD (Spring 1967), Assistant Professor of Philosophy
BA, MA, University of California.
- SCHORLING, HORACE O. (1941), Dean, School of Professional Studies; Professor of Industrial Arts and Technology
BA, San Jose State College; MS, EdD, Oregon State College.
- SCHROER, DALE F. (1963; Spring 1965, Spring 1966), Lecturer in Education
BS, University of Cincinnati; MA, Columbia University.
- SCHROETER, FRANK E. (1949), Associate Professor of Industrial Arts and Technology; Chairman, Industrial Arts and Technology Department
BS, MS, Stout Institute.
- SCHROLL, JOANNE W. (1963), Instructor in Physical Education
BA, MA, Fresno State College.
- SCHWARTZ, MARVYN S. (1958), Director of Health Services
BA, Fresno State College; MD, University of California.
- SCHWITTERS, JAN D. (Spring 1967), Assistant Professor of Mathematics
BS, Iowa State University; MS, PhD, University of Arizona.

- SCOTT, FREDERIC A. (1957), Professor of Physics; Chairman, Physics Department
BS, New York State College; MS, Lehigh University; PhD, Rice University.
- SELKIRK, ROBERT J., JR. (1948), Principal Vocational Instructor in Agriculture
(on sabbatical leave, spring)
BS, MEd, University of California (Davis)
- SENESE, DONALD L. (1965), Assistant Professor of History
BA, Harvard University.
- SHACKLETT, ROBERT L. (1949; 1955), Professor of Physics
BA, Fresno State College; PhD, California Institute of Technology.
- SHAW, JOHN A., JR. (1965), Assistant Professor of Economics
BA, San Diego State College; MS, Purdue University.
- SHAW, ROGER L. (1964), Assistant Professor of Mathematics
BA, MA, University of Denver.
- SHEEHAN, PAUL V. (1930), Professor of Journalism; Chairman, Journalism Department (on sabbatical leave, spring)
BA, MA, University of Washington; PhD, University of Southern California.
- SHEPARD, BERNARD A. (1948), Professor of Journalism
BA, Union College; BS, Columbia University; MS, PhD, Syracuse University.
- SHOCKLEY, JAMES T. (1951; 1956), Associate Professor of Physics
BA, MA, Fresno State College; PhD, University of Southern California.
- SIA, MING B. (1964), Assistant Professor of Nursing
BA, Hwa Nan College (China); MA, Teachers College, Columbia University.
- SIBLEY, FRANCIS M. (1963), Assistant Professor of English
BA, North Georgia College; BA, Auburn University; MA, Louisiana State University.
- SILVANI, HAROLD (1962), Laboratory School Teacher
BA, Fresno State College.
- SIMPSON, ELIZABETH P. (1965), Assistant Professor of Elementary Education; Operation Fair Chance
BA, Fresno State College.
- SINGH, MOHINDER (1966), Assistant Professor of Management and Marketing
BS, Gordon College (India); MS, LLB, Banara Hindu University; MBA, University of California at Los Angeles.
- SLOAN, FORREST E. (1954), Associate Professor of Elementary Education
BS, Illinois State Normal University; MA, EdD, Colorado State College.
- SMALLEY, R. GAYLE (1963), Assistant Professor of Art
BFA, Rochester Institute of Technology; MFA, Indiana University.
- SMARDAN, LAWRENCE E. (1966), Professor of Home Economics
BA, MS, University of Southern California; PhD, Cornell University.
- SMITH, CHARLENE K. (1960), Associate Professor of Education (on leave, Technical Assistance Program, Jamaica)
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.
- SMITH, JAMES H. (1955), Professor of Engineering
EE, MS, University of Cincinnati; BA, BS, PhD, University of Illinois; Registered Electrical Engineer.
- SMITH, JAMES MITCHELL (1965), Assistant Professor of Psychology
BA, University of California at Los Angeles.

- SMITH, PHILIP N. (1958), Associate Professor of Biology
BA, PhD, University of California.
- SOLLIE, ALICE J. (Spring 1959), Assistant Professor of Home Economics
BS, MS, Oregon State University.
- SOMMER, DOROTHY C. (1965), Assistant Professor of Nursing
BS, University of Buffalo; MN, University of Washington.
- SPANGLER, RICHARD C. (Spring 1963), Associate Professor of Economics;
Chairman, Economics Department
BA, MA, PhD, University of California at Los Angeles.
- SPARKS, RICHARD K. (1961), Dean, School of Education; Director of Teacher
Education; Professor of Education
BA, University of Washington; BA (Ed), Central Washington College of
Education; MA, EdD, University of California.
- SPEERS, SAUNDRA L. (1964), Activities Adviser
BA, University of Utah.
- SPENCER, EDWARD M. (1950), Dean of Educational Services and Summer
Sessions
BS, Iowa State College; MA, PhD, State University of Iowa.
- STAEBLER, ARTHUR E. (1955), Professor of Biology
BS, MS, PhD, University of Michigan.
- STAMOLIS, GEORGE J. (Spring 1967), Lecturer in Geology
BS, MS, University of Washington.
- STANDING, KEITH M. (1958), Associate Professor of Biology (on sabbatical
leave, spring)
BS, MS, Brigham Young University; PhD, Washington State University.
- STANLEY, GEORGE M. (1948), Professor of Geology (retired, spring)
BS, MA, PhD, University of Michigan.
- STEPHENS, CAROLYNE M. (1966), Assistant Professor of Speech
BA, MA, EdD, University of California; MEd, University of Virginia.
- STEWART, JOHN O. (1966), Assistant Professor of English
BA, Los Angeles State College; MA, Stanford University; MFA, State Uni-
versity of Iowa.
- STITTICH, ELEANOR M. (1964), Assistant Professor of Nursing
BSNE, MLitt., University of Pittsburgh; Registered Nurse.
- STORY, SYDNEY R. (1963), Assistant Professor of Sociology at Bakersfield
Center
BA, MA, PhD, University of California at Los Angeles.
- STRONG, WINSTON C. (1940), Principal Vocational Instructor in Agriculture
(on sabbatical leave, spring)
BA, Stanford University; MA, EdD, University of California.
- SVENSON, KARL A. (1954), Professor of Political Science
BA, University of Wyoming; MA, Indiana University; PhD, State University
of Iowa.
- SWINEFORD, EDWIN J. (1964), Assistant Professor of Secondary Education;
Chairman, Secondary Education Department
BA, Fresno State College; MA, University of California; EdD, University of
Virginia.
- TAGLIABUE, MARY P. (1964), Assistant Professor of Foreign Languages
BA, Rosary College (Illinois); MA, Northwestern University; MA, University
of Wisconsin.
- TAKIZAWA, CHIAKI (1964) Field Instructor in Social Work (CDC)
BS, University of Utah; MSW, University of Illinois.

- TANIGUCHI, IZUMI (1963), Assistant Professor of Economics
BBA, MBA, University of Houston.
- TAO, JULIE C. (1966), Librarian I
BA, National Taiwan University; MLS, University of California.
- TAYLOR, CHARLES (1938), Professor of Speech
BA, Fresno State College; MA, University of Southern California; EdD, University of California at Los Angeles.
- TAYLOR, FRANK E, JR. (1965), Assistant Professor of Accounting and Quantitative Studies
BS, MBA, University of California at Los Angeles.
- TAYLOR, VERA C. (1965), Assistant Professor of Home Economics
BS, MS, Iowa State University.
- THOMPSON, GENE L. (1965), Assistant Professor of Art
BFA, California College of Arts and Crafts; MFA, Cranbrook Academy of Art.
- THOMPSON, SHIRLEY M. (1953), Assistant Professor of Physical Education
BS, MS, University of Wisconsin.
- THORP, LEONARD W. (1963), Librarian II at Bakersfield Center
BA, Whitman College (Washington); BLS, University of Washington.
- TIDYMAN, CLAYTON R. (1957), Professor of Accounting; Chairman, Accounting and Quantitative Studies Department
BS, MBA, PhD, University of Southern California; Certified Public Accountant.
- TING, TSE-FENG C. (1966), Librarian II
BA, National Taiwan University; MLS, University of Oklahoma.
- TITUS, CHARLES B., JR. (1963), Assistant Professor of Accounting and Quantitative Studies
BS, MA, University of Oklahoma; PhD, University of Texas.
- TOCCHIO, OCTAVIO J. (1959), Associate Professor of Criminology
BA, Suffolk University, MA, American University.
- TRIBBEY, BERT A. (1965), Assistant Professor of Biology
BA, University of California at Santa Barbara; PhD, University of Texas.
- TUCHIN, ELIZABETH (1966), Librarian II
BBA, University of Miami; MLS, McGill University.
- TUCKER, HAZEL M. (1966), Assistant Professor of Foreign Languages
BA, University of California at Los Angeles; MA, National University of Mexico.
- TUELLER, DALLAS A. (1946), Academic Vice President; Professor of Political Science
BA, San Jose State College; PhD, Stanford University.
- UPHOLD, WILLIAM B., JR. (1954), Professor of English and Philosophy
BA, ThB, Taylor University; BD, Drew University; PhD, University of Southern California.
- VAN ELSWYK, MARINUS, JR. (1957), Intermediate Vocational Instructor in Agriculture (on sabbatical leave, fall)
BS, Fresno State College; MEd, University of California at Davis; PhD, University of Arizona.
- VAN GALDER, ROBERT B. (Spring 1963), Assistant Professor of Physical Education
BA, MA, Fresno State College.
- VAN ZWALENBERG, GEORGE (1963), Assistant Professor of Mathematics
BS, Calvin College (Michigan); MA, University of Florida.

- VARLEY, BARBARA K. (1965), Professor of Social Work
BS, MSW, University of Utah; DSW, Western Reserve University.
- VARNER, LEO P. (1956), Director, Bakersfield Center; Professor of Education
BA, Howard Payne College; MS, EdD, University of Southern California.
- VAVOULIS, ALEXANDER (1963), Assistant Professor of Chemistry
BA, MA, Brooklyn College; EdD, University of the Pacific.
- VEVERKA, ROBERT E. (1965), Assistant Professor of Finance and Industry
BA, College of St. Thomas; LLB, University of Notre Dame.
- VORCE, ARMAND E. (Spring 1967), Assistant Professor of Music
BS, Ithaca College; MS, State University of Iowa.
- WAIBEL, GRACE T. (1963), Librarian II
BA, College of St. Catherine (Minnesota); MA, George Washington University; MA, University of Minnesota.
- WAKE, WILLIAM H. (1964), Assistant Professor of Geography at Bakersfield Center (on leave)
BA, Stanford University; MA, Columbia University; PhD, University of California at Los Angeles.
- WAKEFIELD, JOHN W. D. (1965), Assistant Professor of English
BA, Hull Yorks University; MA, State University of New York.
- WALKER, HAROLD E. (1965), Executive Vice President; Professor of Philosophy
BA, Whittier College; BD, Hartford Seminary; PhD, University of Edinburgh.
- WALKER, MARGUERITE LIENARD (1959), Associate Professor of Art at Bakersfield Center
BA, Western Washington College of Education; MA, PhD, University of Washington.
- WALKER, PHILLIP N. (1950), Associate Professor of Speech; Chairman, Speech Arts Department
BA, MA, University of Washington.
- WALKER, THOMAS L. (1965), Instructor in Speech
BA, MA, Idaho State University.
- WALTON, WENDEL K. (1963), Assistant Professor of Speech (on leave)
BA, MA, San Francisco State College.
- WANG, CHENG (1950), Professor of Social Science
BA, MA, PhD, Stanford University.
- WARDLE, ORRIN D. (1957), Executive Dean; Director of Institutional Studies; Professor of Education
BS, MS, Utah State College; EdD, University of California.
- WARMERDAM, CORNELIUS A. (1947), Professor of Physical Education
BA, Fresno State Collège; MA, Stanford University.
- WATKINS, EUGENE C., Lieutenant Colonel, USAF (1963), Professor of Aerospace Studies; Chairman, Aerospace Studies Department
BA, University of Colorado.
- 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 Office Administration and Business Education
BS, MA, Ball State Teachers College; MS, Indiana University; EdD, University of Southern California.

- WEIHS, FRANK A. (1961, 1965), Assistant Professor of English
BA, Portland State College; MA, University of Washington.
- WEILER, JOHN H., JR. (1962), Associate Professor of Botany
BS, University of Nebraska; PhD, University of California.
- WELCH, THOMAS L. (1966), Librarian II
BA, Sacramento State; MS, University of Illinois.
- WELLS, MABEL G. (1966), Assistant Professor of Social Work (MCWD)
BA, MSW, Howard University.
- WEST, LORRAINE W. (1957), Assistant Professor of Education at Bakersfield
Center (on leave)
BA, Fresno State College; MA, Stanford University.
- WEST, VIRGINIA C. (1941), Librarian IV
BA, University of California; BS, MS, University of Southern California.
- WHEELER, CHARLES L., JR. (1959), Test Officer
BA, Pasadena College; BD, Nazarene Theological Seminary; MA, Fresno State
College.
- WIGHT, WILMA F. (1940), Associate Professor of Office Administration
BA, MA, Stanford University.
- WILCOX, ORLEY W. (1959), Professor of Education; Chairman, Advanced Edu-
cation Department (spring)
BA, Southwestern College (Kansas); MS, Kansas State Teachers College;
EdD, University of Colorado.
- WILD, ERNEST S. (1948), Associate Professor of Physical Education
BS, MS, Kansas State College.
- WILEY, FRANCIS A. (1946), Professor of History
BA, Emory and Henry College; MA, Duke University; PhD, University of
California.
- WILLEMSEN, ELEANOR W. (1964), Assistant Professor of Psychology
BA, MA, PhD, Stanford University.
- WILLIAMS, WESLEY M. (1961), Associate Professor of Art
BA, MA, University of California; EdD, Stanford University.
- WILSON, DONALD M. (1956), Associate Professor of Speech
BA, Western Washington College of Education; MA, PhD, University of
Southern California
- WILSON, GORDON (1947), Associate Dean of Students (Activities—Housing)
BA, Fresno State College; MS, University of Southern California.
- WINTER, JAMES H. (1947), Professor of Music; Assistant to the Dean, School
of Arts and Sciences
BA, Carleton College; MMus, Northwestern University; PhD, State University
of Iowa.
- WOMACK, ENNIS B. (1947), Professor of Chemistry
BA, MA, Union University; PhD, University of Chicago.
- WOMACK, J PRINTISE (1958), Librarian III
BA, San Francisco State College; MLS, University of California.
- WOOD, FORREST G. (1963), Assistant Professor of Social Science at Bakersfield
Center
BA, MA, Sacramento State College; PhD, University of California.

- WOODWICK, KEITH H. (1955), Professor of Biology; Chairman, Biology Department
BS, Jamestown College; MS, University of Washington; PhD, University of Southern California.
- WRIGHT, EVELYN H. (1948) Counselor
BA, Cedar Crest College; MA, Syracuse University.
- WRIGHT, JOHN W. (1929), Professor of Speech
BA, MA, University of Washington; EdD, University of California.
- ZANE, BURKE (1962), Associate Professor of Mathematics
BA, Fresno State College; MA, PhD, University of Oregon.
- ZENDER, MICHAEL J. (1966), Assistant Professor of Physics
BA, St. John's University; PhD, Vanderbilt University.
- ZUFALL, GLORIA A. (1965), Assistant Professor of Physical Education
BA, MS, Arizona State University.
- ZUMWALT, EUGENE E. (1959), Associate Professor of English
BA, MA, University of Oregon; PhD, University of California.

PART-TIME FACULTY, 1966-1967

- ADDINGTON, ARCH R., Professor of Geology
BA, MA, University of Indiana.
- ALEXANDER, MARY K., Assistant Professor of Home Economics
BS, Iowa State University.
- ALLEN, MAUNA L., Instructor in English
BS, Utah State University.
- ALLEN, ROBERT V., Assistant Professor of Social Work
BA, MSW, University of California, Berkeley.
- ALLEN, RUTH M., Assistant Professor of Psychology
BA, MA, Fresno State College.
- ANDERSON, PAUL R., Assistant in Biology
BA, Chicago Teachers College.
- ATEN, WILLIAM A., Instructor in Plant Science
BS, Fresno State College.
- BENITEZ, FRANK, Assistant in Foreign Languages
BA, Saragossa University (Spain).
- BERG, ORRIN, Assistant Professor of Psychology
BA, Tabor College; MS, Kansas State Teachers College; PhD, University
of Denver.
- BERMAN, PETER P., Assistant Professor of Management and Marketing
BA, San Jose State College; MBA, University of Santa Clara.
- BERTOLDI, ALLEN E., Instructor in Art
BA, Fresno State College.
- BITTERS, STANLEY C., Instructor in Art
BA, University of California at Los Angeles.
- BOWEN, MARY L., Assistant in Foreign Languages
BA, Fresno State College.
- BRIGGS, PAUL E., Lecturer in Animal Science
BS, Chico State College.
- BROWN, RICHARD E., Assistant Professor of Journalism
BA, Stanford University.
- CABELLO, GEORGE, Assistant in Foreign Languages
BA, Fresno State College.
- CAFFEE, JAMES A., Lecturer in Health Education
BS, MD, University of California.
- CARDELL, MARTHA, Instructor in Music
BA, Fresno State College; MA, University of Washington; MA, Ecole Nor-
male; PhD, University of Washington.
- CEHRS, ELIZABETH W., Assistant Professor of Home Economics
BS, MS, University of Washington.
- CLEGG, REED K., Assistant Professor of Criminology and Social Work
BS, MS, University of Utah; LLB, American Extension School of Law.
- COLVIN, WILLIAM W., Assistant in Physical Education
BA, Fresno State College.
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