ASU BULLETIN

ARIZONA STATE UNIVERSITY

GENERAL CATALOG

1985-86 / 1986-87

$4.00

Arizona State University

General Catalog 1985-86/1986-87

All colleges and departments establish certain academic requirements which must be met before a degree is granted. These requirements concern such things as curricula and courses, majors and minors, and campus residence. Advisors, directors, department chairs and deans are available to help the student understand and arrange to meet these requirements, but the student is responsible for fulfilling them. At the end of a student's course of study, if requirements for graduation have not been satisfied, the degree will not be granted. For this reason it is important for all students to acquaint themselves with all regulations and to remain currently informed throughout their college careers and to be responsible for completing requirements. Courses, programs, and requirements described in the catalog may be suspended, deleted, restricted, supplemented or changed in any other manner at any time at the sole discretion of the University and the Arizona Board of Regents. The catalog does not establish a contractual relationship but it summarizes the total requirements which the student must presently meet before qualifying for a faculty recommendation to the Arizona Board of Regents to award a degree.

Address requests for additional information to:

DIRECTOR OF ADMISSIONS

ARIZONA STATE UNIVERSITY

TEMPE, ARIZONA 85287

Arizona State University reserves the right to change without notice any of the materials— information, requirements, regulations—published in this catalog.

Refer to Appendix A, page 454, for Arizona State University's Statement on Grievances of Discrimination.

No employee, agent, or institution under the jurisdiction of the Arizona Board of Regents shall discriminate or retaliate against any student, employee, or other individual, because of such individual's religious belief or practice or any absence thereof. Furthermore, administrators and faculty members are responsible to reasonably accommodate individual religious practices. A refusal to accommodate is justified only when undue hardship would result from each available alternative of reasonable accommodation. Religious holidays are published in the *ASU Insight* and/or the *University Bulletin*, official faculty/staff publications, at the beginning of each semester.

Arizona State University complies with the Family Educational Rights and Privacy Act of 1974 as amended (see page 15).

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Academic Organization

COLLEGE OF LIBERAL ARTS

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COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN

Departments: Architecture; Design Sciences; Planning.

COLLEGE OF BUSINESS

Departments: Accounting; Decision and Information Systems; Economics; Finance; General Business; Management; Marketing; Purchasing, Transportation, Operations; Center for Health Services Administration.

COLLEGE OF EDUCATION

Departments: Counselor Education; Educational Administration and Supervision; Educational Psychology; Educational Technology and Library Science; Elementary Education; Higher and Adult Education; Secondary Education; Special Education.

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

School of Engineering. Departments: Chemical and Bio Engineering; Civil Engineering; Electrical and Computer Engineering; Industrial and Management Systems Engineering; Mechanical and Aerospace Engineering.

Department of Computer Science.

Divisions of Agriculture, Construction and Technology.

COLLEGE OF FINE ARTS

Schools: Art, Music

Departments: Dance, Theatre.

COLLEGE OF LAW

COLLEGE OF NURSING

COLLEGE OF PUBLIC PROGRAMS

Schools: Walter Cronkite School of Journalism and Telecommunication; Justice Studies; Public Affairs.

Departments: Communication; Leisure Studies.

SCHOOL OF SOCIAL WORK

GRADUATE COLLEGE

SUMMER SESSIONS

OFF-CAMPUS ACADEMIC SERVICES

ASU WEST

University Calendar

Fall Semester	1985	1986
Priority Date for Receipt of Undergraduate Admissions or Readmission Credentials	30 Days prior to the first day of classes	
Orientation and Advisement for New Students	Aug. 19-23, M-F	Aug. 18-22, M-F
New Faculty Orientation	Aug. 22, Th	Aug. 21, Th
Registration and Drop/Add	Consult *Schedule of Classes*	
Instruction Begins	Aug. 26, M	Aug. 25, M
Labor Day—Classes Excused	Sept. 2, M	Sept. 1, M
Unrestricted Withdrawal Deadline	Sept. 20, F	Sept. 19, F
Candidates for Bachelor's Degree Must File Application for Graduation by	Oct. 11, F	Oct. 10, F
Mid-Semester Scholarship Reports Due in Office of Registrar	Oct. 25, F	Oct. 24, F
Restricted Course Withdrawal Deadline	Nov. 1, F	Oct. 31, F
Veterans Day—Classes Excused	Nov. 11, F	Nov. 11, T
Thanksgiving Recess—Classes Excused	Nov. 28-29, Th-F	Nov. 27-28, Th-F
Restricted Complete Withdrawal Deadline	Dec. 5, Th	Dec. 4, Th
Instruction Ends	Dec. 12, Th	Dec. 11, Th
Reading Day	Dec. 13, F	Dec. 12, F
Final Examinations	Dec. 16-20, M-F	Dec. 15-19, M-F
Commencement	Dec. 20, F	Dec. 19, F
Mid-Year Recess Begins	Dec. 21, Sa	Dec. 20, Sa

Spring Semester	1986	1987
Priority Date for Receipt of Undergraduate Admissions or Readmission Credentials	30 days prior to the first day of classes	
Orientation and Advisement for New Students	Jan. 15-17, W-F	Jan. 14-16, W-F
Registration and Drop Add	Consult *Schedule of Classes*	
Instruction Begins	Jan. 20, M	Jan. 19, M

Spring Semester	1986	1987
Unrestricted Withdrawal Deadline	Feb. 14, F	Feb. 13, F
Candidates for Bachelor's Degree Must File Application for Graduation by	Feb. 14, F	Feb. 13, F
Presidents' Day—Classes Excused	Feb. 17, M	Feb. 16, M
Spring Recess—Classes Excused	Mar. 8-16, Sa-Su	Mar. 7-15, Sa-Su
Mid-Semester Scholarship Reports Due in Office of Registrar	Mar. 21, F	Mar. 20, F
Restricted Course Withdrawal Deadline	Apr. 4, F	Apr. 3, F
Restricted Complete Withdrawal Deadline	May 1, Th	Apr. 30, Th
Instruction Ends	May 7, W	May 6, W
Reading Day	May 8, Th	May 7, Th
Final Examinations	May 9, 12-15, F, M-Th	May 8, 11-14, F, M-Th
Commencement	May 16, F	May 15, F

Summer Sessions	1986	1987
Instruction Begins (First five-week session)	June 2, M	June 1, M
Instruction Begins (Eight-week session)	June 2, M	June 1, M
Unrestricted Withdrawal Deadline (First 5-week and 8-week Sessions)	June 9, M	June 8, M
Restricted Course Withdrawal Deadline (First 5-week and 8-week Sessions)	June 20, F	June 19, F
Restricted Complete Withdrawal Deadline (First 5-week Session)	June 27, F	June 26, F
First Five-Week Session Ends	July 3, Th	July 3, F
Candidates for Bachelor's Degree Must File Application for Graduation by	July 3, Th	July 3, F
Holiday	July 4, F	
Instruction Begins (Second five-week sessions)	July 7, M	July 6, M
Unrestricted Withdrawal Deadline	July 14, M	July 13, M
Restricted Complete Withdrawal Deadline (8-week Session)	July 18, F	July 17, F

Summer Sessions	1986	1987
Eight-Week Session Ends	July 25, F	July 24, F
Restricted Course Withdrawal Deadline (Second 5-week Session)	July 25, F	July 24, F
Restricted Complete Withdrawal Deadline (Second 5-week session)	Aug. 1, F	July 31, F
Second Five-Week Session Ends	Aug. 8, F	Aug. 7, F
Commencement	Aug. 8, F	Aug. 7, F
College of Education-Delayed Session	**1986**	**1987**
Instruction Begins (First Session)	June 9, M	June 8, M
Unrestricted Withdrawal Deadline (First 5-Week Session)	June 16, M	June 15, M
Restricted Course Withdrawal Deadline (First 5-Week Session)	June 27, F	June 26, F
Holiday	July 4, F	
Restricted Complete Withdrawal Deadline	July 7, M	July 3, F
First Session Ends	July 11, F	July 10, F
Instruction Begins (Second Session)	July 14, M	July 13, M
Unrestricted Withdrawal Deadline (Second 5-Week Session)	July 21, M	July 20, M
Restricted Course Withdrawal Deadline (Second 5-Week Session)	Aug. 1, F	July 31, F
Restricted Complete Withdrawal Deadline	Aug. 8, F	Aug. 7, F
Second Session Ends	Aug. 15, F	Aug. 14, F

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One hundred years ago. . . .

. . . the only institution of higher learning in the half million square miles bounded by Los Angeles on the west, Provo on the north, Austin to the east, and the Mexican border to the south, was the Arizona Territorial Normal School.

Recognition by the founders of the need for a teacher training school has transcended the years—response to the needs of the state's constituencies is unchanged.

Over the years—through bleak and boom times, five name changes and thirteen presidents—the Normal School grew to a prestigious position as Arizona State University, the nation's sixth largest university on a single campus.

The enterprise begun in 1885 shall never be finished—to perfect the labors of the founders is the spirit and credo of Arizona State University's Centennial theme:

"Excellence for a New Century."

Included in the plans for a second century of growth are both academic and facility expansions. New land acquisitions have provided space for the development of ASU West, a 300-acre campus devoted to upper-level courses for the westside populace of Maricopa County, which was established with Legislative approval; the Children's Hospital, a state-owned unit near ASU which will be used for community access projects; and the University Research Park, developed for private enterprise research use from land previously used for the ASU Farm.

A recent donation from the Del Webb Corp. of Sun City West gave the $8.65 million Sundome to ASU for use in its public events program. The firm also provided land for use in the Sun Cities program.

Objectives

Arizona State University provides an opportunity for students to pursue a full range of high-quality academic programs, from the baccalaureate through the doctoral degree.

Active research programs contribute to and expand knowledge, thereby serving the instructional needs of students, contributing to the professional advancement of the faculty, and enhancing economic, social, cultural, and technological progress.

The University's teaching and research programs help instill in students a spirit of critical inquiry and challenge them to seek answers to fundamental questions of human concern.

The University seeks to expand cultural horizons, improve moral and ethical standards, and educate for responsible citizenship while preparing its graduates to accept and perform capably in rewarding careers.

Organization

Arizona State University is part of a three-university system governed by the Arizona Board of Regents, a body corporate and politic with perpetual succession under the Constitution and laws of Arizona. The Board consists of eight citizens appointed by the Governor of the State for terms of eight years, and one non-voting student regent serving for one year, with the elected Governor and State Superintendent of Public Instruction as members *ex officio*.

The Regents select and appoint the President of the University, the chief executive officer and the regular means of communication between the Board of Regents and the institution. The President is aided in the administrative work of the institution by the Vice Presidents, Deans, Directors, De-

partmental Chairs, Faculties, and other officers. Refer to page 5 for academic organization.

These academic units develop and effectuate the teaching, research and service programs of the University, aided by the University libraries, museums, and other services.

The faculties and students of the University play an important role in educational policy, with a Faculty Senate, joint University committees and boards, and the Associated Students serving the needs of a large institution. A comprehensive system of joint faculty, student, alumni and staff committees provides an exchange of ideas and collaboration on the part of all members of the University.

Accreditation and Affiliation

Arizona State University is accredited by the North Central Association of Colleges and Secondary Schools. Professional programs in the various colleges, schools, divisions and departments are accredited by the following national bodies:

Architecture and Environmental Design: National Architectural Accrediting Board, American Institute of Planners, Foundation of Interior Design Education and Research, Industrial Design Society of America, American Society of Landscape Architects; **Business:** American Assembly of Collegiate Schools of Business, Accrediting Commission on Education for Health Services Administration; **Education:** American Psychological Association, National Council for the Accreditation of Teacher Education, State Board of Education (Arizona);

Engineering and Applied Sciences: American Council for Construction Education, North Central Association for Teacher Education (through Secondary Education Department), Accreditation Board for Engineering and Technology, Inc., National Association of Industrial Technology; **Fine Arts:** National Association of Schools of Music; **Law:** American Bar Association, Association of American Law Schools;

Liberal Arts: American Association of Teachers of French, American Chemical Society, American Council on Teaching Foreign Language, American Dietetic Association, American Medical Association, American Psychological Association, American Speech-Language-Hearing Association, Arizona Foreign Language Association, Committee on Allied Health Education, Modern Language Association, Rocky Mountain Modern Language Association; **Nursing:** The National League for Nursing, American Nurses Association, Arizona State Board of Nursing; **Public Programs:** American Council on Education in Journalism, National Association of Schools of Public Affairs and Administration; **Social Work:** The Council on Social Work Education.

University Campus

Location. Arizona State University is located near the heart of metropolitan Phoenix, in the city of Tempe (population 140,000). Nearby are the municipalities comprising the fast-growing Valley of the Sun — Scottsdale, Mesa, Chandler, Glendale and other communities.

Main Campus-Tempe: The main campus comprises more than 600 acres and offers outstanding physical facilities to support the University's educational programs. Buildings are modern, air-conditioned, and designed for function and attractiveness.

Broad pedestrian malls laid out in an easy-to-follow grid plan, bicycle lanes connecting all parts of the University, and spacious lawns and sub-tropical landscaping characterize a campus serving the physical, aesthetic, and educational needs of students, faculty, and staff.

Research Park. Arizona State University's new Research Park, being developed on a 320-acre site southeast of the main campus, is expected to house up to 50 tenant firms drawn from private technological and social research companies from around the world. A hotel complex and recreational facilities are included in the plans. The Research Park project is designed to bring ASU to the forefront of the high-tech revolution.

ASU West. ASU West should be a fully operating campus serving 5,000 upper-level students by 1990. The new campus, a 300-acre site bounded by Thunderbird and Sweetwater Roads and 43rd and 51st Avenues in Phoenix, could have its first building in use by the 1988-89 school year. Upper-division and graduate courses, library services, a microcomputer laboratory, reception of ITFS courses from ASU main campus, limited food service, and on-site student services are already available at ASU West Alhambra. See page 379 for further information.

Center for Executive Development Annex: The Center operates an 8,000 square foot conference center with seminar rooms and offices at 2200 South Priest Road, Tempe.

Louise Lincoln Kerr Cultural Center: Located in Scottsdale, the Center offers cultural events, especially in the performing arts, for the community.

Camp Tontozona: Located in the famed Mogollon Rim country near Kohl's Ranch northeast of Payson, this continuing education facility of the University serves the needs of academic departments conducting teaching and research in mountain terrain.

Stevens House: Located downtown and anchoring a corner of one of Phoenix' oldest existing residential blocks, this restored structure offers historical exhibits and showcases current university projects and accomplishments for visitors to this city park.

University Libraries and Collections

The collections of the University's libraries comprise more than 1.9 million volumes, approximately 1.7 million microform units and more than 21,000 periodical and serial subscriptions. Computer access to commercially produced bibliographic data bases and the ability to borrow research materials from other libraries enhance local resources.

Charles Trumbull Hayden Library. The main library houses the largest multidisciplinary collection. In addition to the open stack areas, separate collections and service areas include Curriculum, Government Documents, Interlibrary Loan, Microforms, Reference, Reserve, Rare Books and the Arizona Collection, including the papers of several major Arizona political figures.

Architecture Library. In addition to books and periodicals, this library, located in the College of Architecture and Environmental Design, contains the Paolo Soleri archives.

Arizona Historical Foundation Library. Under a cooperative agreement with ASU, the Foundation's library of several thousand volumes is housed in the Charles Trumbull Hayden Library.

Bimson Library. Located in the College of Business, Bimson Library houses a small collection of ready-reference materials and current periodicals. The bulk of the library's holdings in all areas of business and economics is found in Hayden Library.

Law Library. This comprehensive collection of legal materials is located in the John S. Armstrong Law Building.

Music Library. A large collection of music scores, recordings and music reference materials, plus listening facilities for individuals and groups, is located on the third floor of the Music Building. Special collections include the Wayne King Collection, the Pablo Casals International Cello Library and the International Percussion Reference Library.

Daniel E. Noble Science and Engineering Library. Opened in 1983, this major branch library houses books, journals, and microforms in the sciences and geography, the Solar Energy Collection, and the Map Collection.

University Archives. The records of the University, its official publications and publications of its faculty, students and staff are preserved in this collection.

Cultural Arts Resources

Gammage Center for the Performing Arts, was designed by Frank Lloyd Wright and named for the late President Grady Gammage. This versatile auditorium seats 3,000 and has won wide acclaim for its design and acoustics. In addition to the great hall and related facilities (including the Aeolian-Skinner organ contributed by Hugh W. and Barbara V. Long, largest pipe organ in the state), the building contains classrooms and workshops for the College of Fine Arts.

Sundome Center for the Performing Arts. As America's largest single-level theatre, the Sundome in Sun City West has 7,169 seats. The theatre is equipped with sophisticated and state-of-the-art lighting systems, and a single-span roof affords each seat a clear view. As one of Arizona's premier entertainment venues, the Sundome provides a varied array of top entertainment from Las Vegas concerts to classical ballets to celebrity lectures.

University Art Collections. On display in Matthews Center, the collections include paintings in oil, watercolor and tempera, numerous works of sculpture and ceramics, and an extensive print collection.

Permanently exhibited are selections from the Oliver B. James Collection of American Art, which ranges from the early 18th century to the modern era, and includes master works by Ryder, Homer, Eakins and all the members of the Ash Can School of painting. Master works by great printers such as Dürer, Rembrandt, Whistler and Hogarth are often featured in special exhibitions.

The gallery devoted to Latin American art features historical and antique folk materials and paintings by masters including Diego Rivera and David Siqueiros. Throughout the galleries, craft works by American folk artists, 19th and 20th century craftsmen, are interspersed with the painting and sculpture presentations. Special showings of historical and contemporary traveling exhibitions are scheduled throughout the year.

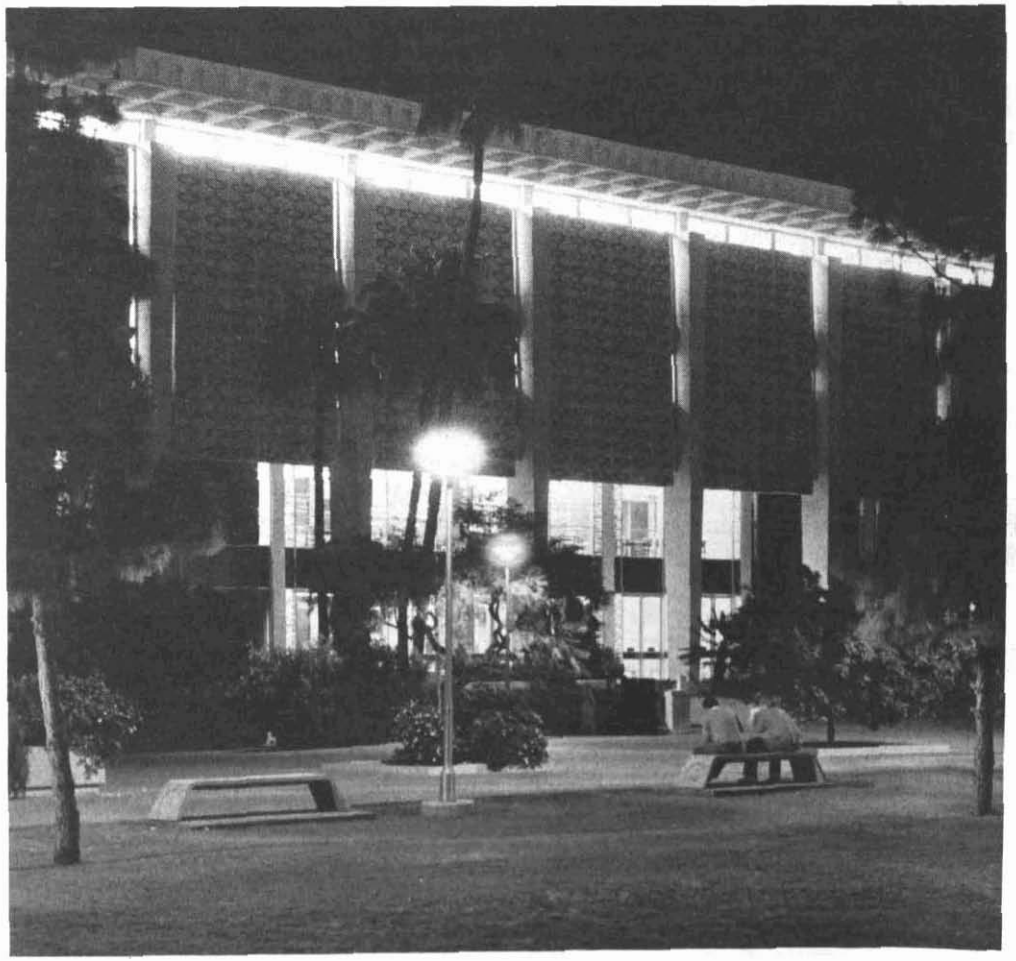
Harry Wood Gallery. Housed in the Art Building (Room 120), the Gallery provides year-round, temporary exhibitions of the visual arts.

Northlight Gallery. This facility is dedicated to qualitative exhibitions of the art of photography and is located in Matthews Hall.

Television Station KAET. KAET, Channel 8, Phoenix, is licensed and owned by the Arizona Board of Regents and operated by Arizona State University. Studios of the award-winning station are located in the Stauffer Communication Arts Building. The station is affiliated with Public Broadcasting Service (PBS), and broadcasts daily from 7 a.m. to midnight. Program information is available from the KAET program manager.

Alumni Association

Founded in 1894, the Alumni Association involves graduates and former students throughout Arizona and around the world. It communicates with all alumni and provides services to dues-paying members. The Alumni Center (601 E. Apache Blvd.) maintains more than 125,000 files of graduates. The Alumni Association strives to promote effective interest in and loyalty to Arizona State University on the part of alumni and the general public.



Undergraduate Program

Arizona State University shares with other colleges and universities a tradition that is hundreds of years old. Its purpose is the exchange of knowledge and the pursuit of wisdom. What makes a university special is that it provides a place where the teacher and student are encouraged to exchange ideas and information within an atmosphere of intellectual honesty.

All persons who can give evidence—usually by way of acceptable academic credentials—of suitable preparation are welcome at the University, without regard to race, skin color, religious creed, or national origin. Remaining in good standing in the University community, however, becomes a privilege and not a right, since the student by enrolling assumes certain obligations of conduct and performance. These have been set up by the University in order to enable it to function effectively.

Under the Constitution and the laws of the State of Arizona, jurisdiction and control over Arizona State University have been vested in the Arizona Board of Regents. The Regents in turn grant broad legal authority to the President, the administration, and the faculty to regulate student life, within reasonable limits.

The University has an educational interest in student conduct on the campus as well as at various events and functions off-campus which are sponsored by the University. As a voluntary community, the University prefers to develop responsible student citizenship by example and advice.

Students are expected, as part of their obligations, to be familiar with the *Code of Conduct*. Violations of this *Code of Conduct* are subject to University discipline, whether committed by individuals or groups. This is also true of violation of University regulations with regard to academic dishonesty.

Family Educational Rights and Privacy Act of 1974
(Buckley Amendment)

This Act sets forth the requirements governing the protection of the privacy of the educational records of students who are or have been in attendance at Arizona State University.

Definitions

Eligible Student. For the purpose of this Act, an *eligible student* is defined as any individual formally admitted to and enrolled at Arizona State University or the parents of a *dependent* eligible student. Dependency is defined by Section 152 of the Internal Revenue Code of 1954.

Record. Any information or data recorded in any medium, including, but not limited to: handwriting, print, tapes, film, microfilm, microfiche, and electronic means.

Types of Information

"Educational Record" refers to those records which are directly related to a student and are maintained by an educational institution. Two types of educational records are subject to the provisions of this Act, 1) Directory Information and 2) Personally Identifiable Information. The term does not include those records specifically excluded by Section 99.3 of the Privacy Act.

Directory Information includes the following student information: name, local and permanent address, local telephone number, date and place of birth, citizenship, residency status, academic level, major field of study, college of enrollment, participation in

officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student.

Personally Identifiable Information includes the name of a student, the student's parent or other family member(s), the address of the student, a personal identifier such as the student's Social Security number, a list of personal characteristics or, other information which would make the student's identity easily traceable.

Access to Records

Eligible students, or parents of a dependent eligible student, may inspect and review their educational records. Some form of photo identification must be displayed before access to educational records will be allowed.

Directory information may be released to anyone without consent of the student, unless the student indicates otherwise. Students may request that this information not be released by completing a form in the Office of the Registrar. Request to withhold this information will exclude the student from being listed in the annual *Directory*.

All other educational records that contain Personally Identifiable Information may not be released without the written consent of the student. Parents of a dependent student may challenge denial of such access by producing the most current copy of Internal Revenue Form 1040. If that form lists the student in question as a dependent, the parents will be required to sign an affidavit which affirms that the student is their dependent. The affidavit will be retained by the Office of the Registrar. Upon receipt of the affidavit, the University will make student records available to parents as specified under the Privacy Act.

Students may grant access to parents or agencies by completing a form in the Office of the Registrar.

Location of Policy and Records

The following school officials maintain educational records pertaining to students: Registrar; Comptroller; Dean of the Graduate College; Directors of Undergraduate Admissions, Career Services, Student Financial Assistance, Housing, Special Services, and University Testing Service; Deans of the Colleges; Chairs of the Departments and Academic Advisors; Dean of Student Life; International Student Adviser; NCAA Faculty Representative; Coordinators of Intramurals and Orientation. The Custodian of Educational Records at Arizona State University is the Office of the Registrar. Copies of this policy will be available in the following offices: Reserve Section of Hayden Library and the Noble Science and Engineering Library, the Office of the Registrar, the Offices of Undergraduate and Graduate Admissions and the Office of the Dean of Student Life. The Office of the Registrar will also maintain a directory which lists all education records maintained on students by Arizona State University.

Degree Programs Currently Offered at ASU

Programs Leading to the Bachelor's Degree

Accounting
Administrative Services
Advertising
Aerospace Engineering
Agribusiness
Anthropology
Architectural Studies
Art
Asian Languages (Chinese/Japanese)
Biology
Botany
Broadcasting
Chemical Engineering
Chemistry
Choral (Music) - General
Civil Engineering
Communication
Communication Arts
Computer Engineering Technology
Computer Information Systems
Computer Science
Construction
Dance
Design Science
Economics
Electrical Engineering
Elementary Education
Energy Systems Engineering
Engineering Science
Engineering Technology
English
Environmental Resources in Agriculture
Finance
French
General Business
General Science
Geography
Geology
German
Health Science
History
Home Economics
Housing and Urban Development
Humanities
Industrial Design
Industrial Engineering
Industrial Vocational Education
Industrial Technology
Instrumental Music
Insurance
Interdisciplinary Programs (Engineering)
Interdisciplinary Studies
Interior Architecture
Italian
Journalism
Justice Studies
Management
Marketing
Materials Science
Mathematics
Mechanical Engineering
Medical Technology
Microelectronics Engineering Technology
Microbiology
Music
Music Therapy
Nursing
Performance (Music)
Philosophy
Physical Education
Physics
Political Science
Psychology
Purchasing/Materials Management
Quantitative Business Analysis
Radiology
Real Estate
Recreation
Religious Studies
Russian
Secondary Education
Selected Studies in Education
Social Work
Sociology
Spanish
Special Education
Special Programs (Engineering)
Speech and Hearing Sciences
Theatre
Theory and Composition (Music)
Transportation
Urban Planning
Wildlife Biology
Women's Studies
Zoology

Programs Leading to the Master's Degree

Accountancy
Agribusiness
Anthropology
Architecture
Art
Biological Sciences
Botany
Business Administration
Chemical Engineering
Chemistry
Child Drama
Choral Music
Civil Engineering
Communication
Communication Disorders
Community Education
Computer Science
Counseling
Counselor Education
Dance
Economics
Educational Administration and Supervision
Educational Media
Educational Psychology
Educational Technology
Electrical Engineering
Elementary Education
Engineering Science
English
Environmental Resources in Agriculture
Environmental Planning
French
Geography
Geology
German
Health Services Administration
Higher and Adult Education
History
Home Economics
Humanities
Industrial Engineering
Instrumental Music
Justice Studies
Mass Communications
Mathematics
Mechanical Engineering
Microbiology
Music History and Literature
Natural Sciences
Nursing
Performance (Music)
Philosophy
Physical Education
Physics
Political Science

Programs Leading to the Master's Degree (Cont'd)

Psychology
Public Administration
Quantitative Systems
Recreation
Religious Studies
School Library Science
Secondary Education
Social and Philosophical Foundations (Education)
Social Work
Sociology
Spanish
Special Education
Technology
Theatre
Theory and Composition (Music)
Zoology

Programs Leading to the Education Specialist Degree

Counselor Education
Educational Administration and Supervision
Elementary Education
Higher and Adult Education
Secondary Education

Programs Leading to the Doctoral Degree

Anthropology
Botany
Business Administration
Chemical Engineering
Chemistry
Choral Music
Civil Engineering
Computer Science
Counselor Education
Economics
Educational Administration and Supervision
Educational Psychology
Educational Technology
Electrical Engineering
Elementary Education
Engineering Science
English
Exercise Science
Geography
Geology
Higher and Adult Education
History
Industrial Engineering
Instrumental Music
Law
Mathematics
Mechanical Engineering
Microbiology
Physics
Political Science
Psychology
Public Administration
Secondary Education
Social and Philosophical Foundations (Education)
Social Work
Sociology
Solo Performance (Music)
Spanish
Special Education
Zoology

Undergraduate Admission

Arizona State University welcomes application for admission from all persons who feel they can qualify for admission and can benefit from the University's broad spectrum of educational programs and services.

The Arizona Board of Regents adopted new admission standards to be effective for students entering ASU in or after the Fall Semester of 1987. Higher entrance standards will require applicants to meet general aptitude and basic competency requirements.

Students who will apply for admission to ASU for the Fall Semester, 1987 or thereafter, should contact the University Undergraduate Admissions Office for information on the revised standards.

Prospective students may call (602/965-7788) or write to the Admissions Office (136 Mocur Building) for information including application materials. With reasonable advance notice, the Admissions Office will arrange for a tour of the campus and, if desired, a meeting with an academic advisor in the applicant's field of interest. (These are listed on page 17 of this catalog.)

A toll-free number, 1-800-252-2781, is available to request *admission information only*. Requests for specific information relating to academic programs or student services should be addressed to the appropriate department, division or college.

Orientation

University orientation programs for new students and their parents are provided at numerous times during the year including the beginning of each semester. Each orientation program includes advisement, placement testing, campus tours, tuberculin skin tests (if applicable), special events, and an introduction to University resources and procedures. Newly admitted students will be sent information preceding each available orientation program. Students are strongly encouraged to attend orientation activities.

Admissions Procedures for New Freshman and Transfer Applicants

Persons interested in admission to an undergraduate program at Arizona State University will need to have the following items on file in the Admissions Office: 1) Application for Admission (including Domicile Affidavit); 2) official transcript(s); 3) American College Test (ACT) or Scholastic Aptitude Test (SAT) scores (as needed); and 4) the $10 application fee (for applicants residing out of the State of Arizona only). Applicants are urged to send their materials as soon as possible. This will enable the University officials to make an early decision concerning the applicant's admission and permit the student to take part in early registration and orientation.

Priority deadlines are listed in the University Calendar (page 6). Applications received after those dates may not be honored for the semester desired. A completed application for admission is valid only for the semester for which admission is requested.

Application. Prospective students must submit a completed and signed application on the official application form to the Admissions Office. All applicants for undergraduate admission residing out of the State of Arizona pay a nonrefundable application fee of $10 at the time application for admission is made.

Domicile Affidavit. Like other state-supported colleges and universities, Arizona State University distinguishes between in-state and out-of-state students with regard to tuition. Bona fide residents of Arizona are required to file a Domicile Affidavit with the Admissions Office. Students who neglect to do so will be assessed out-of-state tuition and fees. If there is any question or doubt, the student should consult the Residency Classification Officer, 1 Moeur Building, or call 602/965-7712.

Transcripts. Official transcripts of academic records from high school, as well as any other institution of higher education the student has previously attended, must be *mailed directly* to the Undergraduate Admissions Office by the records office of the issuing institutions. Transcripts sent in or hand-carried by the applicants themselves will not be accepted. High school transcripts must show grade point average, rank in class, and date of graduation. The applicant is responsible for requesting that transcripts be sent. Applicants with 24 hours or less of transferable credit must also have official high school records submitted.

Entrance Examinations. All new freshman applicants must take either the American College Test (ACT) or Scholastic Aptitude Test (SAT) on a national test date in their junior or senior year of high school. Applicants for transfer who have not completed at least 9 semester hours of acceptable work with a grade point average of 2.00 or better on a 4.00 = A scale must submit either ACT or SAT scores.

A report of the test scores must be sent to the Admissions Office directly from the American College Testing Program, P. O. Box 168, Iowa City, Iowa 52240, or The College Board Admissions Testing Program, Box 592-R, Princeton, NJ 08540.

Health History Questionnaire. Every newly admitted student must complete the Arizona State University Health History Questionnaire and must provide a complete, verified immunization history for Student Health. A free tuberculin skin test is recommended for students who come from a high risk environment for exposure to tuberculosis. Admission may be denied or cancelled for any applicant who has been shown by the University to have either an uncompensated psychiatric illness or a physical illness which can be hazardous to the safety of other persons.

Undergraduate Admission Standards

The Arizona Board of Regents establishes undergraduate admission standards for the University in general. *Particular colleges, schools, or departments within the University may establish stricter standards. These are given in the respective sections of the Catalog and should be noted by students planning to enroll in any of these programs.*

Admission Requirements for Entering Freshmen: Academic

Graduation from Secondary School. In order to be eligible for admission to Arizona State University, an applicant must have graduated from a recognized high school with a satisfactory scholarship defined as follows:

1. Rank in the upper 50% of the high school graduating class, OR,
2. Achieve a minimum composite ACT score of 21 (in-state applicants) or 23 (out-of-state applicants), OR,

3. Achieve a minimum composite SAT score of 930 (in-state applicants) or 1010 (out-of-state applicants).

Engineering applicants must rank in the upper 25% of their graduating class or score a minimum on the ACT of 23 or SAT of 1050. Computer Science applicants must rank in the upper 20% of their graduating class or score a minimum on the ACT of 24 or SAT of 1100. Students not satisfying the above requirements will be admitted into pre-professional programs if admissable to the University. Applicants to Speech and Hearing Science must rank in the upper one-third of their graduating class.

If the applicant is unable to meet these specific admission requirements, it is possible to file a letter of appeal with the University Undergraduate Admissions Board, 136 Moeur Bldg., Arizona State University, Tempe, AZ 85287. The decision of the Board is final. The applicant must be able to meet at least one of the following criteria to be considered for appeal:

1. A high school grade point average of 2.50 or higher on a 4.00 = A scale.
2. An upward grade trend during the high school career, or an upward grade trend during the senior year.
3. Positive recommendations from secondary school administrators, faculty, or counselors based on considerations such as: academic potential, work experience, leadership ability, or extracurricular activities.
4. An average score on the General Education Development (GED) test of 50 or greater.
5. Demonstration of the ability to complete college freshman level academic studies with a grade point average of 2.00 or higher on a 4.00 = A scale in courses in English, social science, mathematics, physical or natural science, foreign languages, fine arts, or the humanities. The applicant must have earned at least 9 credit hours at a community college or summer or evening sessions at a university, or both.

Classification of Secondary School Subjects

Group I	English. Courses with major emphasis upon grammar, composition, and literary analysis.
Group II	Foreign Languages. Classical or modern foreign language. Two units or more are recommended.
Group III	Mathematics. One unit of algebra and one unit of mathematics other than arithmetic, business mathematics, or general mathematics.
Group IV	Social Studies. History, civics, communication, economics, sociology, geography, and government (including United States and Arizona Constitution).
Group V	Laboratory Sciences. Courses in biology, chemistry, and physics, in which at least one regular laboratory period is scheduled each week.
Group VI	Fine Arts. Historical, theoretical and performance courses in art, music, communication and drama, and humanities.
Group VII	Agriculture, bookkeeping, general science, home economics, arithmetic, general mathematics, journalism, industrial arts, secretarial training, physical education, military science, and other subjects commonly offered for credit by secondary schools.

Recommended Secondary School Subject Units. The following recommended pattern of subjects is that which, on the basis of experience, can be reasonably expected to provide satisfactory preparation for college when these subjects have been completed with better than average grades. *Academically talented students are strongly urged to take additional courses* from Groups I through V beyond those recommended. The definition of a unit is that used by the North Central Association of Colleges and Secondary Schools.

English (from Group I)	4
or English 3 and one Foreign Language 2 (from Groups I and II)	or 5
Mathematics (from Group III)	3
American History and Social Studies (from Group IV)	2
Laboratory Science (from Group V)	2
Electives (from Groups I through VII)	6
depending upon English option	or 5
	16 or more

The School of Engineering recommends 3½ units in mathematics, including advanced algebra, geometry and trigonometry. Calculus is recommended. The laboratory sciences chosen should include at least one unit in physics and one unit in chemistry. One unit of biology is strongly recommended.

The College of Nursing recommends 2½ units of mathematics, including algebra, advanced algebra and one additional unit of mathematics. Laboratory sciences should include one unit of biology and one unit of chemistry or their equivalents. An additional unit of physics is recommended.

Conditional Admission Prior to Graduation from High School. Conditional admission may be granted to high school seniors who submit a six-semester or seven-semester transcript which shows academic quality and rank in class in keeping with admission standards, and who complete the steps in the undergraduate admission procedures. Regular admission will be confirmed when a verification of the high school graduation showing final grade point average, rank in class and date of graduation has been received in the mail by the Undergraduate Admissions Office directly from the high school. The conditional admission may be cancelled if the final verification shows that the applicant has not met the University requirements for admission.

Admission with Distinction. Admission with Distinction certificates recognizing outstanding scholarship are awarded to entering freshmen who rank in the top 10% of their high school graduating classes. This designation is honorary in nature and does not include a financial award.

Able and Ambitious Program. The high school senior with only a limited amount of work remaining for completion of high school graduation, who ranks in the top 10% of the class, may be granted *special enrollment* as an unclassified student to enroll for *a maximum of six hours per semester* at the University. To qualify, the following conditions must be met:

1. An application for the Able and Ambitious Program must be submitted to the Admissions Office. Applicants sign an agreement that they will continue in high school while enrolled at Arizona State University and that they will graduate with their high school class.
2. An official transcript of the high school record showing senior standing and rank (top 10%) in class must be sent directly to the Admissions Office by the high school.
3. The principal or counselor of the high school must send a written recommendation to the Undergraduate Admissions Office authorizing the enrollment of the high school senior at Arizona State University at the same time the student is completing the high school program.

Admission of Unclassified Applicants —Undergraduate. Any person 19 years of age or older or who has graduated from high school and meets the regular admissions standards may enroll for six semester hours or less per semester of undergraduate course work as an unclassified student. Such a student is not required to file a transcript or domicile affidavit. It will be necessary, however, to file an Unclassified Student Admission application. An unclassified student cannot be a candidate for any University degree. Persons disqualified or otherwise not eligible for regular admission will not be permitted to attend as unclassified students.

An unclassified student who decides to work toward a bachelor's degree will have to *apply for admission to a degree program* with the Undergraduate Admissions Office, and meet all the admission requirements that apply to degree-seeking students at the time of application. No more than 15 hours of completed unclassified work may be applied to a degree program, if the completed courses meet specific requirements within a degree program.

Once registered in a regular degree program, a student will not be permitted to register again in unclassified status.

Transfer Applicants

An applicant for transfer admission must have a grade point average of 2.00 or higher (see specific college requirements) on a 4.00 = A scale in all work undertaken at previous institutions of higher learning, and at the same time must be in good standing and eligible to return to such institutions.

Transfer applicants to the following areas must have the respective minimum grade point average shown: Computer Science—2.75; Engineering—2.50; Construction—2.25; Technology—2.25; Speech and Hearing Science—2.50; Elementary Education—2.50. (International applicants should see requirements on page 23.) Applicants with less than 12 semester hours of completed transferable work will follow the procedures for entering freshmen, as out-

lined on page 19. Applicants with 24 hours or less of transferable work must submit official high school records.

Transfer Credit

Credit will be awarded for traditional course work successfully completed at institutions of higher learning as indicated by Arizona State University and the Board of Regents. Whether the specific credits can be applied toward a degree depends on the requirements of the department, division, or college in which the student is enrolled. There are several qualifications: (1) Transfer credit is not given for courses in which the lowest passing grade (D) or in which a failing grade was received. (2) While courses successfully completed but evaluated on nontraditional grading systems (e.g. pass-fail) are acceptable for transfer, some colleges in the University may not accept such credits to fulfill graduation requirements. (3) Grades and honor points earned at other colleges and universities are considered for admission, but are not included in computing the student's cumulative grade point average at Arizona State University.

Certain types of graduate credits cannot be transferred to Arizona State University, including: (1) credits awarded by postsecondary institutions in the United States that lack candidate status or accreditation by a regional accrediting association; (2) credits awarded by postsecondary institutions for life experience (unless validated by comprehensive, proficiency, or standardized examinations); (3) credits awarded by postsecondary institutions for courses taken at non-collegiate institutions (e.g. governmental agencies, corporations, industrial firms, etc.); (4) credits awarded by postsecondary institutions for non-credit courses, workshops, and seminars offered by other postsecondary institutions as part of continuing education programs; (5) credits given for extension courses.

Acceptable academic credits earned at other institutions that are based on a different unit of credit than the one prescribed by the Arizona Board of Regents are subject to conversion before being transferred to Arizona State University.

Veterans Exception. By Arizona statute, no failing grades received by a veteran at an Arizona university or community college prior to military service may be considered when determining admissibility. This exception applies only to veterans who are 1) honorably discharged, 2) who have served in the Armed Forces of the United States for a minimum of 2 years and 3) who have previously enrolled at a university or community college in Arizona. Military service records must be submitted including form DD 214.

Community Colleges. A maximum of 64 semester hours of credits will be accepted as lower division credit when transferred from community, junior, or two-year colleges.

Community college students who plan to transfer to Arizona State University at the end of their first or second year are strongly advised to plan their community college courses to meet the requirements of the curriculum they select.

Students Attending Other Arizona Colleges and Universities.

To determine the equivalency of courses between Arizona institutions and those offered at Arizona State University, students should refer to the "Arizona Higher Education Course Equivalency Guide" in consultation with their academic advisor. Provided their college attendance has been continuous, students will be permitted to follow the degree requirements specified in the Arizona State University catalog in effect at the time they began their community college work. (See page 44.)

Conditional Admission Prior to Receipt of Final Transcript. Students enrolled in other colleges and universities will be considered for conditional admission on the basis of meeting all admission requirements, except for a final transcript of work in progress. This final transcript must be sent to the Undergraduate Admissions Office from the issuing institution immediately after the work in progress has been completed. Hand-carried transcripts will not be accepted. *Regular admission will be confirmed only after the final transcript has been received, showing that the applicant has met the University admission requirements.* In the event the applicant does not qualify or has falsified application documents, admission and registration will be cancelled, and any registration fees paid will be returned.

Appeal Procedure. Transfer students who feel they have been unjustly denied credit for courses they have taken may appeal to the standards committee of the college in which they have enrolled. (This does not apply to community college transfer of credit over the 64-hour maximum, see above.) The decision of this committee is final.

Applicants for transfer admission whose academic record fails to meet Arizona State University scholarship admission standards or who have been disqualified because of deficient scholarship, conduct, or other reasons by the college or university previously attended, will be denied admission. Such applicants, however, may write a letter of appeal accompanied by letters of recommendation, to the University Undergraduate Admissions Board, 136 Mocur Bldg., Arizona State University, Tempe, AZ 85287, for reconsideration of their applications. The decision of this Board is final.

Admission of Disabled Applicants. Academically qualified disabled persons are encouraged to apply for admission to Arizona State University.

A pre-admission inquiry may be made by the Office for Disabled Student Resources, in order to better assist the incoming student with the appropriate support services. The inquiry will be made on a confidential basis, in an effort to take remedial action, in meeting the individual applicant's needs. This is a voluntary action by the University. Refusal to provide such information will have no bearing on the applicant's admission or treatment at Arizona State University.

Before the beginning of the academic term the student must arrange for attendant care and other personal assistance, if so advised by a physician. The student has the sole responsibility of arranging for personal care assistance.

Auxiliary aids related to educational programs and activities may be provided by the Office for Disabled Student Resources. For additional information about available resources see page 48.

To ensure a smoother transition into the University community, all prospective disabled students are urged to contact the Office for Disabled Student Resources, Student Health, Room 177, Arizona State University, Tempe, AZ 85287.

Undergraduate Admission of International Applicants

For admission purposes, international applicants are defined as all persons who are not citizens of the United States of America.

All international applicants seeking admission to Arizona State University, in addition to meeting the standards for undergraduate admission, either as freshman or transfer applicants, must fulfill the following requirements:

1) Meet admissions requirements.

Freshmen: Must have a 3.00 minimum cumulative grade point average on a 4.00 = A scale in secondary school work.

Transfer (12 credit hours or more): Must have a cumulative grade point average of 2.50 or higher on a 4.00 = A scale in all work undertaken at the previous institution of higher learning and at the same time be in good standing and eligible to return to such institution(s).

2) Demonstrate proficiency in the English language. The University requires all international applicants whose native language is not English to take the Test of English as a Foreign Language (TOEFL). A minimum passing score of 500 is required for admission. Applicants to the School of Engineering, the Department of Computer Science, and the Division of Construction, must score a minimum of 550 on the TOEFL.

   The scores must be submitted directly to the Undergraduate Admissions Office from TOEFL, Box 899, Princeton, New Jersey 08540.

3) Provide a personal data sheet certifying that they possess adequate financial resources to support themselves while in residence at the University. International applicants on scholarship must provide a letter of financial responsibility from the sponsoring agent or organization.
4) Meet all appropriate immigration standards and requirements.
5) Have all required admissions materials and credentials reach the Undergraduate Admissions Office at least two months prior to the beginning of the semester for which application is being made.

International Student Information

1) Upon admission to the University, international students are issued a Certificate of Eligibility (Form I-20 or IAP-66) which enables them to apply for the appropriate visa.
2) All international students are required to have insurance coverage against illness and accident before being permitted to register. Insurance must be maintained throughout the student's enrollment in the University and may be obtained at the time of registration.
3) Upon arrival on campus, international students must report to the International Student Adviser.

American Language and Culture Program. Arizona State University offers an intensive

English training program for non-native speakers of English. Inquiries about the curriculum, fee schedule, etc., should be addressed to The American Language and Culture Program, Arizona State University, Tempe, AZ 85287. Acceptance into the American Language and Culture Program is separate from admission to the University.

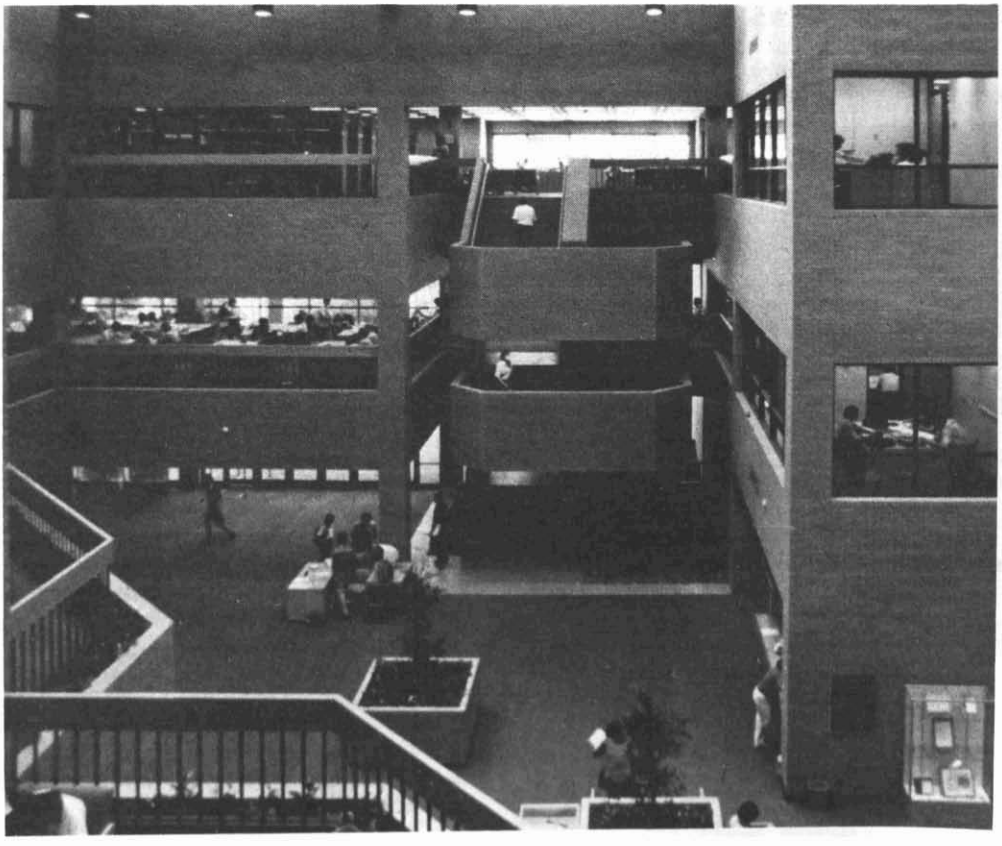
Readmission to the University

Undergraduate students who have previously attended Arizona State University but have not been enrolled at this institution for one semester or more, will be required to apply for readmission for the semester in which re-enrollment is intended. If meanwhile the student has attended an accredited college or university other than Arizona State University, it will be necessary for the student to have on file an official transcript of all academic work taken. Failure to report such attendance is considered misrepresentation and falsification of university records. In addition, it is considered cause for "Records Hold" action and withholding of further registration privileges.

An applicant for readmission to a classified program must meet the requirements for good standing (page 38) and the requirements of the college to which the application is being made. An applicant who has been denied readmission may appeal to the University Undergraduate Admissions Board.

Former students who have not attended the University for two years or more must take a chest X-ray or tuberculin skin test and complete the Health History Questionnaire. Both are available at Student Health.

Conditional Readmission. A student completing academic work in progress at another institution may be granted conditional readmission. This conditional status will remain effective until an official transcript is received. The student will be subject to "Records Hold" action and additional registration privileges will be withheld if this condition for readmission is not cleared by mid-semester.



Special Programs for Advanced Placement and Credit

(Maximum of 30 hours of credit awarded for any or all programs including ASU comprehensive and proficiency examinations.)

1) Advanced Placement. Students who have taken an advanced placement course of the College Entrance Examination Board (CEEB) in their secondary school, *and* who have taken an Advanced Placement Examination of CEEB may receive credit with a score of 5, 4 or 3. No credit will be given for any examination with a score of 2 or 1. Sophomore standing in a discipline or area will be awarded with a score of 5.

When the scores are received by the University directly from CEEB, credit will be awarded as follows:

Exam	Score	Credit Hours
Art-History	5 or 4	6 (ARH 101 and 102)
	3	3 (ARH 101 or 102)
Art-Studio-General Art-Studio-Drawing	5,4 or 3	Department will evaluate all portfolios for determination of advanced placement or credit.
Biology	5 or 4	8 (BIO 101 and 102)
	3	4 (BIO 101)
Chemistry	5 or 4	9 (CHM 113 and 115)
	3	4 (CHM 113)
English	5 or 4	6 (ENG 101 and 102; exempt from ENG 105)
Classics (Vergil, Lyric, Prose)	To be evaluated upon receipt	
French, German or Spanish—Language	5,4,3	8-14 (FRE, GER or SPA 201 and 202); additional credit to be recommended by the department)
French, German or Spanish—Literature	5,4 or 3	8-14 (FRE, GER or SPA 201 and 202); additional credit to be recommended by the department
History-American or European	5 or 4	6 (HIS 103 and 104 or 101 and 102)
	3	Department will evaluate examination and recommend
Mathematics-Calculus AB	5,4 or 3	4 (MAT 270)
Mathematics-Calculus BC	Same as for Calculus AB; upon Departmental approval, credit may be granted for MAT 271 as well with a 5 or 4	
Physics B	5 or 4	6 (PHY 111 and 112)
	3	3 (PHY 111)
Physics C	Same as for Physics B; or upon Departmental approval, credit may be granted for PHY 115 and 116 instead with a 5 or 4 score, or PHY 115 with a score of 3	
Computer Science	5	6 (CSC 100 and CSC 101)
Computer Science	4	3 (CSC 100; additional credit to be recommended by the department.)
Computer Science	3	3 (CSC 100)

2) College-Level Examination Program (CLEP). Students who have taken a College-Level Examination of the College Entrance Examination Board may receive University credit. The following table of credit applies to all students enrolling in the University for the first time in August 1975 and any student enrolling thereafter. CLEP examination credit will *not* be given where (a) it duplicates credit previously earned by the student at the University or accepted by the University for work done elsewhere, or (b) it is more elementary than a course in which the student has already received credit. All examinations are given monthly by the University Testing Service.

General Examinations: To obtain credit or placement, students must receive a standard score of 500 or higher for the General Examinations, except for English Composition which requires a standard score of 610. *Students who have completed 60 semester hours of credit are not eligible to receive any credit for the CLEP General Examinations.*

Subject Examinations: A standard score of 50 or higher must be received to obtain credit for any subject examination. The 60-semester-hours-of-credit limitation does not apply to subject examinations.

General Examinations	Credit Hours	Equivalency
English Composition	None	With essay exempts ENG 101 and 102 to enter ENG 105 but without essay see English Composition subject exam or English Placement Examination
Humanities	6	General Studies Credit
Mathematics	3	MAT 106
Natural Sciences	8	General Studies or Major Credit
Social Science	6	Elective Credit

Subject Examinations	Credit Hours	Equivalency
Accounting	6	ACC 101 and 102
American Government	3	POS 300*
American History (6)		
Early Colonization to 1877	3	HIS 103
1865 to the Present	3	HIS 104
American Literature (6)		
I. Colonial Period to 1870	3	ENG 341
II. 1870 to the Present	3	ENG 342
Analysis and Interpretation of Literature	3	General Studies (no credit if English major)
Biology	8	BIO 181 and 182
Clinical Chemistry	None**	Petition Botany/Microbiology Dept. if transfer from an Arizona community college
College Algebra	3	MAT 117
College Algebra and Trigonometry	4	MAT 115
Computers and Data Processing	3	Elective Only
Macroeconomic Principles	3	ECN 111 (Dept. will accept credit
Microeconomic Principles	3	ECN 112 for 111 or 112—not both) No credit or advanced placement if major is Economics or any major in College of Business.

Educational Psychology	3	EDP 310*
English Composition	None	With essay exempts ENG 101 and 102 to enter ENG 105
English Literature	3	General Studies (Seniors may use ENG 221 or 222)
Freshman English	None	Recommend English Composition Subject Exam
Foreign Languages (College French, College Spanish)	0	Placement at Foreign Language level.
Fortran IV	2	ECE 122 *or* ASE 226 *or* ASE 321
General Chemistry	9	CHM 113 and 115
General Psychology	3	PGS 100
Hematology	None**	Petition Botany/Microbiology Department if transferring from Arizona community college
History of American Education	3	SPF 411*
Human Growth and Development	3	CDE 232
Immunology and Blood Banking	4	MIC 420*
Introduction to Business Management	None	No Credit
Introduction to Calculus	4	MAT 270
Introduction to Marketing	3	Elective (no credit if major is in College of Business)
Introduction to Sociology	3	SOC 101
Introduction to Business Law	3	Elective
Microbiology	4	MIC 201 and 202
Money and Banking	3	Elective (no credit or advanced placement if major is Economics or any major in College of Business.)
Nursing (Anatomy, Physiology, Microbiology; Behavioral Sciences for Nurses; Fundamentals of Nursing; Medical-Surgical Nursing)	0	Not acceptable toward BS in Nursing.
Statistics	3	MAT 226 *or* EDP 454*
Tests and Measurements	3	EDP 454*
Trigonometry	2	MAT 118
Western Civilization (9)		
Ancient Near-East to 1648	6	HIS 100 and 101
1648 to the Present	3	HIS 102

*Lower division credit. **See note, petition needed.

All equivalency is subject to future review and possible catalog change.

For further information regarding CLEP, contact the University Testing Service at Payne Hall, Ed B-302, or call 602/965-3104.

3) Comprehensive Examinations. A comprehensive examination is intended to permit a student to establish academic credit in a field in which the student has gained experience or competence equivalent to an established University course. Applications are given only for courses listed in the current University catalog, and only for courses in which a comprehensive examination can serve as a satisfactory measure of accomplishment.

A number of restrictions apply. The student must be presently enrolled at Arizona State University with no more than 100 semester hours of credit earned. The examinations must be taken during the first two semesters in residence at the University. No more than 30 semester hours of credit may be established by comprehensive examinations (including AP and CLEP credit) and/or correspondence courses.

Comprehensive examinations may not be taken in any course in which the student has been given admission credit or transfer credit from any educational institution. If there is a question, the student should consult the Admissions Office. Credit may not be received for an examination in an elementary level of a field in which the student has earned more advanced credit, nor for a prerequisite for a course already completed.

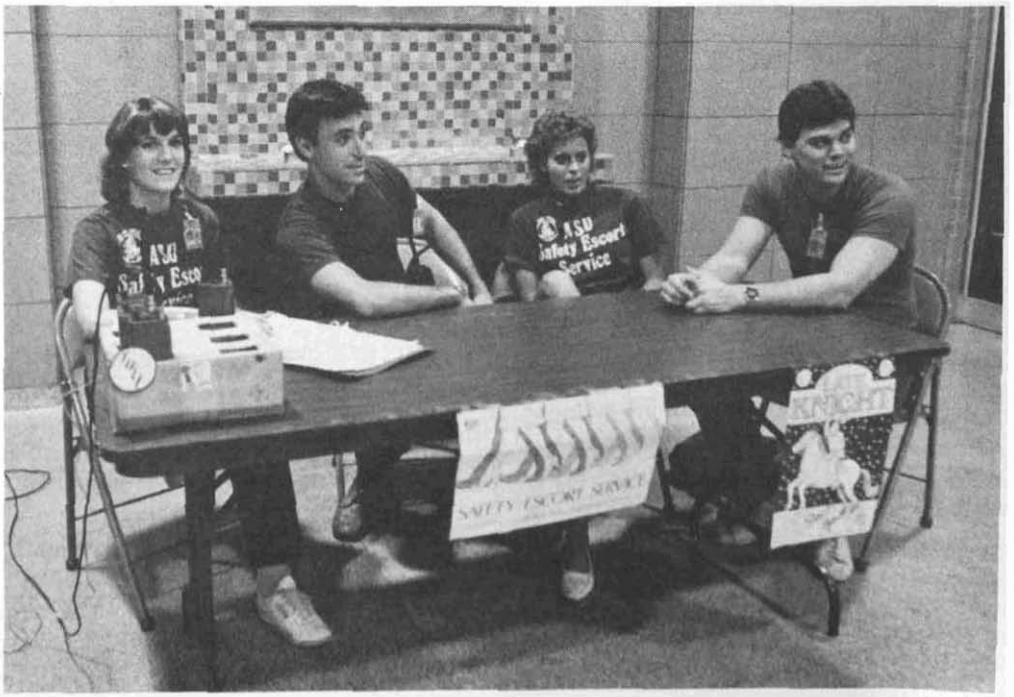
The comprehensive examination is strictly a departmental function. An application is for one course only. The student completes an application form with the number, title, and number of semester hours of credit for the course. When completed, the application must be approved by the student's advisor and the departmental chair.

The student must then pay the stated fee for such examinations at the Cashier's Office. The receipt must be taken to the departmental office.

The examination will be prepared by the instructor who normally conducts the course, and is comprehensive in nature and scope. The instructor and other experts designated by the chair grade the examination, using letter grades: A, B, C, D, or E. If the grade is C or better, a mark of Y is entered on the student's permanent record; otherwise no entry is made. Credit by examination will be indicated as such on the record. The student will be notified by mail of the result of the examination. In case of failure (D or E), the student will *not* be given an opportunity to repeat the examination.

A student pursuing a second baccalaureate degree may not receive credit by comprehensive examination, but with prior approval of the college the student may use the examination to waive a course requirement, if a grade of C or better is earned.

4) Proficiency Examinations. Proficiency examinations are given to: a) waive a course requirement; b) validate certain transfer credits in professional programs; and c) determine a student's ability in a field where competence is an important consideration. Detailed information may be obtained from the dean's office of the college in which the student is registered.



Placement Examinations for Proficiency

English. An entering freshman with an ACT English standard score of 25 or better or SAT verbal score of 600 or better is automatically eligible to enroll in ENG 105 in place of ENG 101 and 102. Students scoring 23 or 24 on ACT or 540-590 on SAT are eligible to take the English Exemption Examination for possible placement in ENG 105. The examination is given during the orientation period before the beginning of each semester and during the summer terms. Further information is available from the Director of Freshman English.

Foreign Language. For information regarding foreign language placement, see page 83 (Foreign Languages), and page 25 (Advanced Placement).

Mathematics. All students registering for introductory mathematics courses are required by the Department of Mathematics to take the Mathematics Placement Examination or, if appropriate, the Calculus Entrance Examination. The examinations are given several times each semester and during the summer. They are designed to determine the course level which will be of most benefit to the student. For further information, contact the Director of Mathematics Placement, Physical Science Center, A Wing.

Military Training—Officers

U.S. Air Force and U.S. Army. R.O.T.C. units are active on the ASU campus. See Aerospace Studies and Military Science in the College of Liberal Arts for additional information.

U.S. Marine Corps. Platoon leaders classes are conducted by the Marine Corps for students who have enlisted in Officers Training while at ASU. Students attend for six weeks in two different summers or 10 weeks in one summer, dependent upon their enlistment date. Credit in Marine Leadership Training (MLT) 302 (3) and MLT 402 (3) is granted for the platoon leaders classes upon the recommendation and certification of the U.S. Marine Corps to the Registrar in the absence of a U.S. Navy R.O.T.C. unit in Arizona.

Defense Activity for Non-Traditional Education Support (DANTES)

Arizona State University is a participating institution with DANTES and is listed in the DANTES Directory of Independent study. DANTES is an executive agency of the Department of Defense which provides educational support for the voluntary education programs of all Services. The primary missions of DANTES are: (1) to provide nationally recognized examination and certification programs as part of the voluntary education programs of military services; (2) to facilitate the availability of high-quality independent institutions for service men and women.

U.S. Armed Forces Institute Correspondence Courses. Arizona State University no longer grants military science credit for active service or courses that were taken through the military.

Fees, Deposits and Other Charges

The fees shown below apply to both credit and non-credit (audit) registrations and are subject to change.

The Board of Regents reserves the right to change fees and charges without notice.

Academic Year Registration and Tuition

Full-time Students. Students registered for 7 or more hours are considered full-time for fee payment purposes. The amounts listed below are per academic semester. Information on in-state versus out-of-state residency classification is on page 32. (Residency Classification, Procedures and Policies).

Registration and Tuition fees are:

In-State Status	$ 495.00
Out-of-state status:	
12 hours and over	$1,922.00
11 hours	$1,804.00
10 hours	$1,685.00
9 hours	$1,566.00
8 hours	$1,447.00
7 hours	$1,328.00

Part-Time Students. Students registered for 6 hours or less .....$53 per hour.

Summer Sessions, Off-Campus Academic Services and Correspondence

Fees are:

Summer Sessions/Off-Campus	
Academic Services	$53 per hour.
Correspondence	$33 per hour.

Further information is included in the sections on Summer Sessions and Off-Campus Academic Services.

Other Fees, Deposits, and Charges

Special class fees and deposits. Certain University classes require payment of fees or deposits for materials, breakage and/or rentals. These fees and deposits are listed in the *Schedule of Classes* for each semester.

Private Music Instruction

½ hour of instruction weekly.....$40.00
1 hour of instruction weekly..... 60.00
More than one hour of instruction weekly—music majors only 60.00

Musical instrument rental charge.

Charge for use of University owned musical instruments..... 10.00

Consult the School of Music for specific information.

Late Registration. This fee is assessed on registrations beginning with the first day of each session $10.00

Admission Application.....$10.00
This is a non-refundable fee paid by out-of-state undergraduate applicants when applying for admission.

Transcripts .....$ 1.00
Request for transcripts should be made two weeks in advance of time desired.

Copies of educational records other than transcripts:

Number of Pages	*Total Charge*
1 to 5	Free
6 to 10	$2.00
11 to 15	$3.00

Copies of aditional pages cost $1 per each 5 pages copied.

Graduation Application or Reapplication:

Undergraduate.....$ 7.00
Graduate 10.00

If the graduation charge is not paid on or before the date specified in the section of the catalog headed Graduation Requirements, a late fee of $5.00 is added to the charge noted above.

I.D. Card Replacement .....$ 5.00
Replacement because of wear or deterioration is free of charge.

Activity Card Replacement.....$10.00

Comprehensive Examination.....$ 7.50 Per Semester Hour

Paid by all students seeking to establish credit by examination.

Parking Permits.....Varies

A parking permit must be purchased for motor vehicles parked on campus. Annual permits run from $33.50 for perimeter parking to $70.00 for controlled access parking.

Returned Checks. Checks returned by a bank are assessed a $10.00 service charge with repayment needed within 5 business days of notification. A second $10.00 service charge is made if the returned check is not repaid within this 5 day period. Repayment of a returned check must be in cash. Students paying registration and tuition with a check that is subsequently returned by the bank for insufficient funds or other reasons are subject to involuntary withdrawal from the University if repayment is not made.

All students involuntarily withdrawn are charged tuition and/or registration based upon the percentage of time in attendance during the semester.

On-Campus Housing. For information on student housing, refer to catalog section on Student Services—Residence Life.

Parking Violations. Violations of the parking regulations are subject to citations and fines. Appeals to parking citations may be filed with the Citations Hearing Officer and after payment may be further appealed to the Parking Appeals Board. Unpaid parking citations are delinquent financial obligations subject to provisions of the section on Delinquent Financial Obligations.

Payment Methods and Deadlines

Check. Checks payable for the exact amount of charges and without a restrictive endorsement are generally acceptable, except for students on check use suspension due to previously returned check(s) from a bank.

Financial Aid. Students receiving financial aid may use their expected aid to pay registration and tuition if these funds have been authorized for this purpose by the Student Financial Assistance Office.

Veterans Deferred Payment. The Veterans Readjustment Assistance Act allow veterans to apply for deferred payment of registration fees. A "Certificate of Eligibility" must be presented. Contact the Veterans Affairs Office for information on meeting the necessary requirements. The University may deny this privilege to students with previous delinquent obligations.

Payment Deadlines. A student's registration is cancelled on the date of payment dead-

line, with the student being required to re-register.

Refunds

Academic Year Registration and Tuition. Students withdrawing from school or individual classes receive a refund as follows:

Withdrawal Date	*Refund*
Before first day of the semester	100% less $10.00
1 through 14 calendar days	80%
15 through 21 calendar days	60%
22 through 28 calendar days	40%
29 through 35 calendar days	20%
After the 35 calendar day	No refund

Withdrawal occurs on the calendar day that an official withdrawal form is presented to any one of the Registrar sites. Students withdrawing for medical or other extenuating circumstances may contact the Comptroller's Office Student Fee Payment Section, Administration Building, Room 109 for refunds that may be available under these circumstances.

Summer Session Fees. Students withdrawing from any Summer Session or individual classes receive a refund as follows:

Withdrawal Date	*Refund*
Before first day of session	100% less $10.00
1st and 2nd days of session	80% refund
3rd day of session	60% refund
4th day of session	40% refund
5th day of session	20% refund
After 5th day of session	No refund

Refunds are based on the class days of the session and not the class meeting dates for any particular classes.

Special Class Fees. Refunds, if any, are determined by the department offering the course. Refund determination is based on withdrawal date, type of activity and costs already incurred by the department.

Private Music Instruction. If a student must drop a music course because of illness or other emergency beyond the control of the student, not more than half of the instruction charge may be refunded, as determined by the School of Music.

Late Registration. Not refundable.

Residence Halls. Refunds to students departing from residence halls prior to end of the academic year are computed on the following basis:

Deposits. Housing deposits are refunded as prescribed by the Residence Life contract that students sign when they apply for residence hall accommodations. Students should refer to this document for specific information on refunds. When checkout occurs prior to the last two weeks of the spring semester, students forfeit their $50 room deposit.

Rent. Students are charged 10% of the total semester rate for each week or partial week of registered occupancy.

Board. Students are charged for meals through the last day of the week in which formal check-out occurs. Students departing during the last two weeks of the semester shall be charged the full semester rate for meals. No refunds are made for meals missed.

Check-out. A student's check-out is based on the date Residence Life is notified on a prescribed check-out form, not the last day of occupancy.

Other University Charges. Other university charges are normally not refundable, except for individual circumstances.

Payment of Refunds. Refunds require student identification and are made net of amounts due the University. When the last day of a refund period falls on a weekend or holiday, the official withdrawal form must be submitted to one of the Registrar sites during regular office hours on the workday proceeding the weekend or holiday. Refunds are normally paid by check and mailed to the student's local address within two weeks.

Forfeiture of Refunds. Refunds are subject to forfeiture unless obtained on or before June 30 of the year originally paid. When June 30 falls on a day when the Comptroller's Office is closed, the refund must be requested by the last working day preceding June 30.

Delinquent Financial Obligations

Board of Regent's Policy 4-103B states:

1. Each university shall establish procedures to collect outstanding obligations owed by students and former students.
2. Each university shall maintain a system to record all delinquent financial obligations owed to that university by students and former students.
3. Students with delinquent obligations shall not be allowed to register for classes, receive cash refunds or obtain transcripts, diplomas or certificates of degree. The university may allow students to register for classes, obtain transcripts,

diplomas or certificate of degree if the delinquent obligation is $25 or less.
4. Unpaid obligations shall remain a matter of record until students and former students satisfy their financial obligations or until satisfactory arrangements for repayment are made with the university.
5. The University may write off delinquent financial obligations of students according to accepted accounting principles and after appropriate collection efforts. No such write-off shall operate to relieve the student of liability for the obligation nor shall such write-off entitle the student to release of any transcript, diploma or certificate of degree or to register for further university classes until such obligation is actually paid.
6. Each university shall include this policy in its bulletin or catalog.

A late charge of $10.00 is made for any balances due the University not paid within 30 days of the initial due date, with a second $10.00 late charge being made if these amounts are not paid within 30 days of the first late charge.

Residency Classification Procedures and Policies

The Arizona Board of Regents is required by law to establish for the universities under its jurisdiction and control uniform guidelines and criteria for the classification of students for payment of registration fees and tuition. There are several criteria that need to be met. Students interested in becoming an Arizona resident, for tuition purposes, should contact the Residency Classification Office soon after arrival in the State. Direct inquiries to: Residency Classification Office, Arizona State University, Moeur 1, Tempe, AZ 85287 or call (602) 965-7712.

Financial Aid

The primary responsibility for financing your college education belongs to you and your family. The Student Financial Assistance Office will assist you in meeting this responsibility by evaluating all aid applications through the use of a standard financial needs analysis system to determine the cost of your education, as well as how much you and your family can afford to contribute toward the cost of education. It is your responsibility to complete all applications in an accurate and timely manner and to notify the Student Financial Assistance Office of any changes in your circumstances that might affect your eligibility (ie., loss of parent's income, change in residency classification, change in marital status, etc.). Student financial assistance is available in the form of scholarships, grants, loans and employment. This aid has been made available collectively by the university, alumni, private foundations, civic groups, individuals, federal and state governments.

To be considered for financial aid you must complete an application separate from your admission application. Either the College Scholarship Service Financial Aid Form or the American College Testing Family Financial Statement are acceptable. One of these forms should be completed annually, between January and March preceding the academic year you anticipate attending ASU. You will be notified by mail regarding any additional items needed to complete your application. These items may include copies of federal tax returns, proof of valid visa, proof of registration with the Selective Service, etc.

A Determination of Eligibility letter will be sent to all applicants. This letter will estimate your expenses and contribution for the aid period. This letter will also specify the amount of your financial need. If you have financial need in excess of $200, you will receive a separate Financial Aid Notification. This letter will inform you of the types and amounts of aid you are eligible to receive through ASU. Be sure to read carefully all correspondence from the Student Financial Assistance Office.

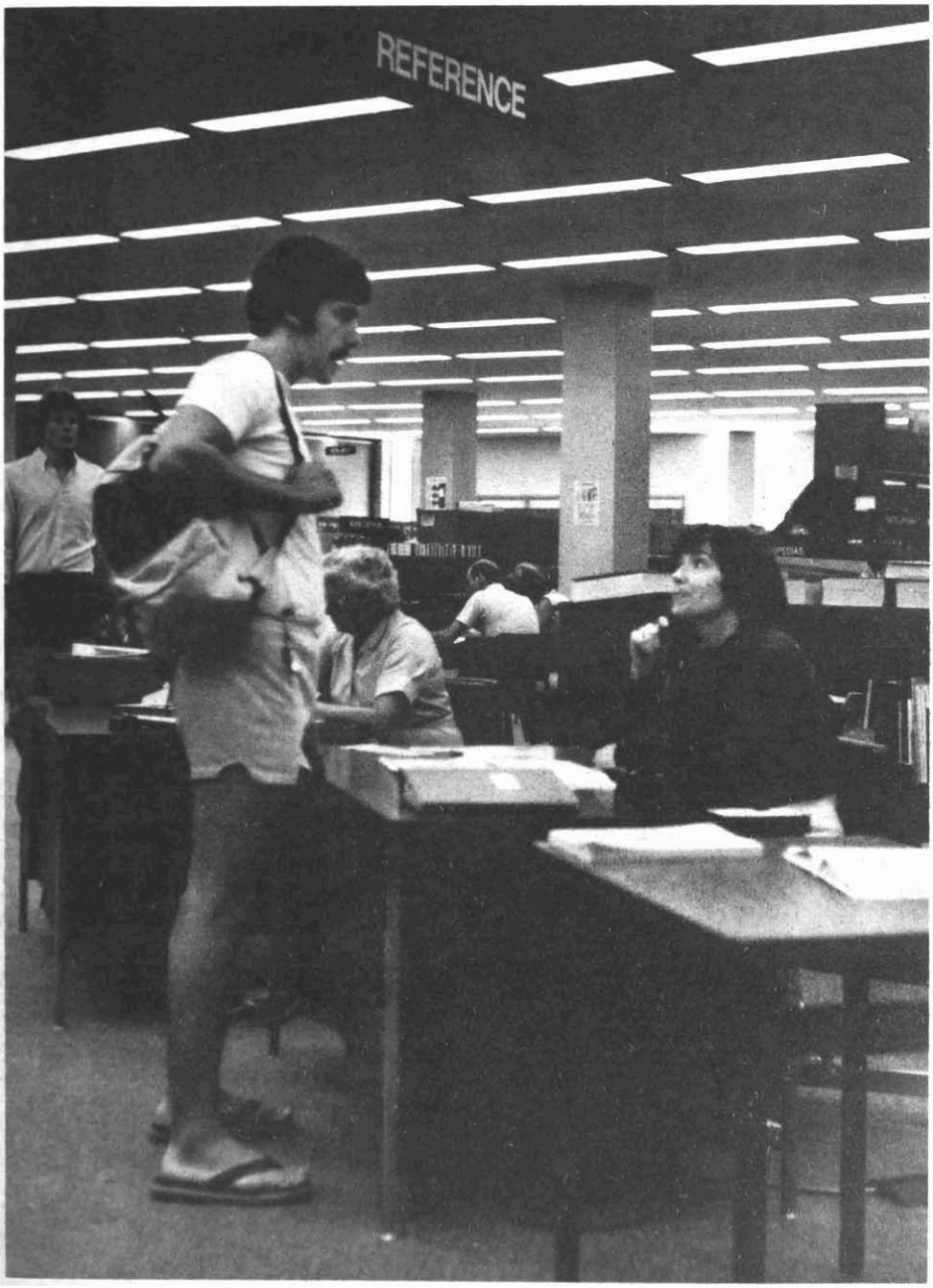
If you receive aid from the Student Financial Assistance Office, you will be required to meet minimum standards of satisfactory academic progress. In addition to maintaining the minimum GPA defined for good academic standing, undergraduate students awarded on a full-time basis must complete a minimum of 24 credit hours within the academic year. Failure to meet these standards will result in the suspension of aid funds for subsequent semesters, until the deficiency is satisfied. Registration fees and other amounts due the university are deducted from financial aid when paid.

Refer to publications of the Student Financial Assistance Office for detailed information concerning the types of aid available and the specific requirements of each program.

Types of Financial Aid

Please refer to publications of the Student Financial Assistance Office for detailed information.

Pell Grant
Supplemental Educational Opportunity Grant (SEOG)
College Work-Study Employment (CWS)
National Direct Student Loan (NDSL)
Guaranteed Student Loan (GSL)
Bureau of Indian Affairs Grant (BIA)
State Student Incentive Grant (SSIG)
Veterans Educational Loan
Migrant Opportunity Program (MOP)
Scholarship
Emergency Loan
PLUS/ALAS Loans



STUDENT BUDGETS FOR 1985-86

(Nine-month living costs: fall and spring semester full-time enrollment)

Cost/Allowance Category	Single On-Campus	Single Living w/ Parents	Single Off-Campus	Head of Household Single +1	Married, No Dependents	Married, One Dependent
Room/Board	$2,800/3,700	$1,200/1,600	$3,500/4,700	$ 5,300/7,100	$ 6,900/9,200	$ 6,900/9,200
Personal (Including Travel)	$1,800/2,400	$1,600/2,100	$1,800/2,400	$ 2,800/3,700	$ 3,600/4,800	$ 4,600/6,100
Living Total	$4,600/6,100	$2,800/3,700	$5,300/7,100	$8,100/10,800	$10,500/14,000	$11,500/15,300
Fees	$ 990	$ 990	$ 990	$ 990	$ 990	$ 990
Books/Supplies (15-hour course load)	$ 450	$ 450	$ 450	$ 450	$ 450	$ 450
Resident Total	$6,040	$4,240	$6,740	$ 9,540	$11,940	$12,940
Tuition	$2,894	$2,894	$2,894	$ 2,894	$ 2,894	$ 2,894
Non-Resident Total	$8,934	$7,134	$9,634	$12,434	$14,834	$15,834

Note:

1. Living expenses (room, board, personal expenses) are stated for a nine-month period. Financial assistance is not normally provided for summer.
2. Students with dependents may add $1,000 per dependent.
3. Tuition and fees are subject to change without notice.
4. The above allowances are the average amounts spent by students for their educational costs. These allowances are used to calculate eligibility for University "need based" financial aid awards. Unless a student is typical in all respects, actual costs may vary according to life style. Financial aid awards will partially assist a student to satisfy this budget.

Classification of Courses

Information about courses appears in two places, the *General Catalog*, published once every two years, and the *Schedule of Classes*, published before the beginning of every semester.

The course numbering system is as follows:

100-299 ("Lower Division" Courses) are designed primarily for freshman and sophomore students. Certain classes are closed to freshmen who lack the designated prerequisites or are majoring in other departments. This information is available in the *Catalog*, the *Schedule of Classes*, or from the student's curriculum advisor.

300-499 ("Upper Division" Courses) are designed primarily for juniors and seniors and other advanced students. Prerequisites and other restrictions should be noted before registration. Courses at the 400-level apply to graduate degree requirements for an individual program of graduate study when approved by the Graduate College.

500-799 ("Graduate Level" Courses) are designed for graduate students. However, upper-division undergraduate students may enroll in graduate courses with the approval of their advisor, the course instructor, the department chair, and the dean of the college in which the course is offered. If the course does not meet an undergraduate graduation requirement, it may be eligible for use in a future graduate program on the same basis as work taken by an unclassified graduate student. (See *Graduate College Catalog* or page 367.)

Special Topics 294, 394, 494 have been reserved for courses covering topics of immediate or special interest of a faculty member and students. Credit, 1-4 hours.

Pro-Seminar 498. Small group study and research for advanced students within their major area. Prerequisite: Major in the department or approval of instructor. Credit, 1-7 hours.

Independent Study 499. The course number 499 has been reserved for Independent Study courses in each of the instructional departments or divisions of the colleges at the undergraduate level. Independent Study courses are honor courses and may be taken only by outstanding senior students who have completed at least one semester in residence. To be eligible for an Independent Study course a student must have a cumulative grade point average of 3.00 or better in his major or field of specialization.

An Independent Study course is designed to provide an opportunity for the superior senior student or for the graduate student to do an original study or investigation in the major or field of speicalization on an individual basis with a minimum of supervision or direction.

An Independent Study course is not a substitute for a catalog course, nor a means of taking a catalog course on an individual basis. Courses listed in the catalog may not be taken as Independent Study.

Application for Independent Study must be made well in advance of the regular registration period with the student's advisor. The application must be signed by the advisor, and approved by the instructor under whom the student will work and by the chair of the department in which the course is taken. A special class fee may be required. Credit 1-3 hours.

Special Liberal Arts Courses. Liberal Arts 100, 101, 171H, 172H are interdisciplinary courses offered by the College of Liberal Arts. LIA 100 (University Adjustment and Survival) and LIA 101 (Use of Research Libraries) are open to all students; LIA 171H, 172H (The Human Event) is restricted to students in the Honors Program.

Honors Courses. The courses listed in the schedule as 298 and 492 (Honors Individual Study), 493 (Honors Thesis) and 497 (Honors Colloquium) are reserved for students in Honors Programs.

An omnibus course is one at a certain level available to academic units who may use their own prefixes before the number. The omnibus number (initially approved by the Vice President for Academic Affairs) is to be used for courses offered on an experimental basis. The title and course content varies with the subject matter.

Special Courses. Undergraduate Internship (484), Special Courses for Research Methods (500), Practicum (580), Field Work (583), Internship (584), Reading and Conference (590), Seminar (591), Research (592), Applied Project (593), Conference and Workshop (594), Special Topics (598), Thesis (599), Research Methods (600), Practicum (680), Field Work (683), Internship (684), Reading and Conference (690), Seminar (691), Research (692), Applied Project (693), Research Methods (700), Practicum (780), Field Work (783), Internship (784), Reading and Conference (790), Seminar

(791), Research (792), Dissertation (799), are set forth in announcements of the Graduate College and are also listed in the respective departments, where offered.

Prerequisites. A student registering for a course must meet the previous course requirement (prerequisites) listed for it or otherwise satisfy the instructor that equivalent preparation has been completed.

Courses Offered. The University does not offer all of the courses listed in the catalog annually or each semester. The *Schedule of Classes* should be consulted for those courses offered each semester.

Key to Course Listing Abbreviations

GLG..... Departmental prefix designation
410..... Course number
(3)..... 3 units credit
F..... Course offered fall only
S..... Course offered spring only
SS..... Course offered summer session only
F,S..... Course offered both semesters
A..... Course offered once a year
F'85,S'86. Course offered every other year on semester indicated
N..... Course not regularly offered
†Dagger indicates further prerequisites

Grading System

Scholarship Grades and Marks. All grades and marks will appear on the grade report and the permanent record.
They are indicated by the following letters:

A—Excellent	NR—No Report
B—Good	P—Pass
C—Average	W—Withdrawal
D—Passing	X—Audit
E—Failure	Y—Satisfactory
I—Incomplete	

Grading Options. Ordinarily a grade of A, B, C, D, or E is given upon completion of a course, unless a grading option of "Audit" or "Pass-Fail" is indicated at the time of registration. *Grading options cannot be changed after the close of the drop/add period.*

Credit Enrollment. The semester hour is the unit on which credit is computed. It represents one fifty-minute class exercise per week per semester. To obtain credit, a student must be properly registered and pay fees for the course.

Audit Enrollment. A student may choose to audit a course, in which case the student attends regularly scheduled class sessions but no credit is earned. The student should first obtain the instructor's approval, be properly registered, and pay the fees for the course.

The mark of "X" will be recorded for completion of an audited course, unless the instructor determines that the student's participation or attendance has been inadequate, in which case, the mark of "W" may be recorded. This grading option may not be changed after the close of drop-add.

Pass/Fail Enrollment. A mark of "P" (Pass) or "E" (Fail) may be assigned for this grading option. This grading method may be used at the option of individual colleges and schools within the University. Consult college dean's office for detailed information and restrictions prior to registration.

Satisfactory. A mark of "Y" (Satisfactory) may be used at the option of individual colleges and schools within the University, and is appropriate for seminars, internships, projects, workshops, readings and conference, theses, and research. The "Y" is included in earned hours, but is not computed in the grade point average.

Incomplete. A mark of "I" (Incomplete) is given by the instructor only when a student who is otherwise doing acceptable work is unable to complete a course because of illness or other conditions beyond the student's control. The mark of "I" is granted only when the student can complete the unfinished work with the same instructor. However, an incomplete (I) may be completed with an instructor designated by the department chair if the original instructor later becomes incapacitated or is otherwise not on campus. The student will be required to arrange with the instructor for the completion of the course requirements and for a change from the mark of "I" to whatever grade is earned within the maximum of one calendar year from the date the mark of "I" is recorded. Marks of "I" received in the Fall 1983 semester or thereafter that have been on a student's record for more than one calendar year will be automatically changed to a grade of "E", and will be treated as a grade of "E" for the purposes of evaluating graduation requirements.

Unrestricted Withdrawal. During the first four weeks of a semester a student may

withdraw from any course with a mark of "W." (Unrestricted withdrawal deadline dates pertinent to summer enrollment are displayed in the *Summer Session Bulletin.*)

Restricted Withdrawal. Between the fourth week and up to the end of the tenth week of a semester students may withdraw with a mark of "W" only from courses in which the instructor certifies that they are passing at the time of the withdrawal. (Restricted withdrawal deadline dates pertinent to summer enrollment are displayed in the *Summer Session Bulletin.*)

However, the number of restricted withdrawals with the mark of "W" is limited: During freshman standing—3; during sophomore standing—2; during junior and senior standing—a total of 2. The preceding limits do not prevent students from withdrawing from the University (Complete Withdrawal) with marks of "W" and/or "E". Complete withdrawal counts as one withdrawal for purposes of applying the above limits to subsequent withdrawals from individual courses. The preceding does not apply to audit enrollment.

An instructor may only withdraw a student from a course with a mark of "W" or a grade of "E" in cases of disruptive classroom behavior. A student may appeal an instructor-initiated withdrawal to the standards committee of the college in which the course is offered. The decision of the committee is final. In accordance with the Withdrawal Policy, restricted withdrawal limits do not apply to withdrawals initiated by an instructor.

Grade Points. For the purpose of computing the grade point average, grade points are assigned to each of the grades for each semester hour as follows: A, 4 points; B, 3 points; C, 2 points; D, 1 point; and E, 0 points. Grade point averages are rounded to the nearest hundredth of a grade point.

Grade Point Average. The grade point average (GPA) is obtained by dividing the total number of grade points earned by the number of semester hours graded — A, B, C, D, or E (net hours). Other grades do not carry grade points. *Semester* GPA is based on *semester* net hours. *Cumulative* GPA is based on *total* net hours.

Change of Grade. The instructor of a course has the sole and final responsibility for any grade reported.

Once a grade has been reported to the Office of the Registrar, it may be changed (1) upon the signed authorization of the faculty member who issued the original grade, or (2) by the academic grievance committee of the college in which the course was offered, if the instructor is no longer at ASU. (Consult department chair of specific course.) In either case, approval is also required by the department chair and dean of the college concerned. This applies also to the grade of Incomplete (I). (See *University Policy for Student Appeal Procedures on Grades*, Appendix B, page 456.)

Repeating Courses. An undergraduate course taken at ASU may be repeated for credit if the grade of "D" or "E" or a mark of "W" is received. This policy does not apply to seminar and independent study courses with different content each semester. When an undergraduate student repeats 100- and 200-level courses, the student's transcript will show both grades but the student's cumulative grade point average will reflect only the higher grade.

After completing the course with a satisfactory grade, the student must then file a Deletion Form with the Office of the Registrar. To be eligible for the deletion of "D" or "E" grades, the course must be repeated at ASU. When an undergraduate student repeats 300- or 400-level courses, the student's cumulative grade point average and the transcript will reflect both grades. Undergraduate courses in which grades of "D" or "E" are received may be repeated only once.

Mid-Term Deficiency Report. Instructors are required to evaluate students at midterm for scholarship deficiencies. A student who has been evaluated for a "D" or "E" at mid-semester will receive a deficient scholarship report. The mid-term "D" and "E" grades are not recorded on the student's permanent record. Mid-term reports are mailed to the student's local address of record.

Final Grade Report. A grade report will be sent to each student at the end of each semester to the permanent address of record.

It is the responsibility of the student to keep the Office of the Registrar informed of address changes.

Records Hold. The Office of the Registrar will place a "Records Hold" on the records of a student when an outstanding financial obligation or disciplinary action has been reported.

When a hold is placed on a record, the following results may occur: (1) Student does not receive a grade report; (2) An offi-

cial or unofficial transcript will not be issued; (3) Registration privileges will be suspended; (4) Other student services may be revoked.

The "Hold" will remain effective until removed by the initiating office. It is the student's responsibility to clear the conditions causing the "Hold."

Transcripts. The Office of the Registrar will release official transcripts *only upon written request of the student.* The request must include: name or former name(s), the student ID number, date of birth, and date of last attendance. No transcript will be issued in case of a "Records Hold." If the transcript is to be mailed, the student must also supply a specific address. The fee for an official transcript is $1.00 per copy.

Unofficial transcripts may be requested in-person at the Office of the Registrar, or by mail if a signed release and self-addressed stamped envelope is enclosed. There is no charge for an unofficial transcript.

All in-person transcript requests require presentation of photo identification. Requests will not be accepted from third parties without a written release from the student.

Retention and Academic Standards

Class Standing of Students.

1 - Freshman, 24 or less hours earned
2 - Sophomore, 25 - 55 hours earned
3 - Junior, 56 - 86 hours earned
4 - Senior, 87 or more hours earned
5 - Graduate, Bachelor's degree from accredited institution

Academic Good Standing. Academic good standing for the purpose of retention is defined as follows:

Total Earned Hours	Minimum Cumulative GPA
24 or less	1.60
25 - 55	1.75
56 or more	2.00

A student who does not maintain the minimum GPA standard will be placed on academic probation or be disqualified. A student on academic probation is in conditional good standing and is permitted to enroll.

In order to transfer from one college to another within the University, or to be eligible for readmission, a student must have a 2.00 GPA or better. The GPA determining good standing is computed on courses taken only at Arizona State University.

For purposes of retention or transfer, an individual college may set higher GPA standards. If a college does not set standards for retention that are higher than the University standards (see above), the University standards will prevail. See the college sections of this catalog or contact the college deans' offices for statements regarding college retention standards.

Satisfactory Academic Progress. The University is required to publish and enforce standards of satisfactory academic progress for certain students (e.g., student athletes, students receiving financial aid or students receiving veterans benefits).

Certification of satisfactory progress is verified by the academic advisor and the dean's designee for certifying satisfactory progress for student athletes. Certification of satisfactory progress for students receiving financial aid or veterans benefits is verified by the Financial Aid Office or the Veterans Affairs Office respectively. Students should contact their advisors or the appropriate office for additional information on satisfactory progress requirements.

Dean's List. Undergraduate students who earn 12 or more graded credit hours (A, B, C, D, or E) during a semester in residence at Arizona State University with a grade point average of 3.50 or better are eligible for the Dean's List. A notation regarding Dean's List achievement will appear on the final grade report for the semester.

Probation. A student's college assumes responsibility for enforcing academic standards, and may place any student on probation who has failed to maintain good standing as defined above. A student on academic probation is required to observe any rules or limitations the college may impose as a condition for retention.

Disqualification. A student who is placed on probation at the end of a semester is subject to disqualification by the college at the end of the following semester if the conditions imposed for retention are not met.

Disqualification is exercised at the discretion of the college and becomes effective on the first day of the semester following college action. *A disqualified student is notified by the dean of the college and/or the Office of the Registrar, and is not allowed to register at the University until reinstated.* A student who has been disqualified may appeal to the college standards committee. A stu-

dent disqualified or otherwise not eligible for regular admission may not attend as an unclassified student.

Reinstatement. In order to be reinstated, the student must submit an application for reinstatement to the disqualifying college. If the student chooses to transfer to another college within the University while disqualified, application for reinstatement must be made to the University Undergraduate Admissions Board.

In addition to applying for reinstatement, a disqualified student who has not registered for one or more semesters must apply for readmission to the University.

Reinstatement Appeals. A student wishing to appeal the decision of the standards committee of a college may apply for a hearing before the University Undergraduate Admissions Board. The decision of the Board is final.

Suspension/Expulsion for Academic Dishonesty. Students who have been expelled from a school, college, or other academic unit within the University may not re-enroll in the University. Students who are suspended for more than ten days from a program within a department, school, or college are also automatically suspended from the University.

All decisions relating to expulsion or suspension that are concerned with academic dishonesty are the sole perogative of the dean of the school or college in which the student has been admitted. These decisions of suspension or expulsion for ten days can be appealed to the University Hearing Board in accordance with Code of Conduct procedures.

After the specified period of suspension, application for reinstatement may be made to any of the academic units within the University. Merely having remained in a suspended status for a period of time does not, in itself, constitute a basis for reinstatement.

Academic Renewal

An undergraduate who has been readmitted to the University after an absence of at least five years, and who has satisfactorily completed at least twelve additional semester hours in residence at ASU, may, upon petition to the dean of the college, have his or her former record treated in the same manner as transfer credits. That is, credit will be granted for up to 64 hours in courses in which a grade of C or better was earned, and the original cumulative grade point average will be listed separately rather than included as part of the ASU grade point average. Such academic renewal may be effected only once during a student's academic career. Students must be aware that the former record remains intact and that, although eligibility for graduation is based on the ASU grade point average, most graduate and professional schools may average the two records together.

General Studies

Arizona State University students are required to demonstrate a satisfactory level of basic knowledge in the humanities, fine arts, social and behavioral sciences, and sciences and mathematics. Specific patterns of General Studies requirements are established by the colleges within the overall program. Since requirements under this program vary somewhat from one curriculum to another, students should refer to the catalog description of the recommended General Studies program within the college in which they are enrolled. Specific disciplines listed within the three overall categories are *not necessarily applicable* to the General Studies program and graduation requirements of each college.

Students transferring from approved institutions of higher education ordinarily will be given General Studies credit, hour for hour, for work done in those institutions insofar as it is equivalent in content to General Studies courses at this University.

All students who are candidates for a bachelor's degree are required to complete 36 to 57 semester hours in upper and lower division General Studies courses, depending upon the college and curriculum in which they are enrolled. The total number of semester hours required in each of the fields listed below is specified by the individual colleges:

Humanities and Fine Arts

Architecture, Art, Communication (see approved list), Dance, English, Foreign Languages, Interdisciplinary Humanities, Music, Philosophy, Religious Studies, Theatre.

Students select with the advisor's approval, two or more courses within a pattern designed to enhance their ability to develop a discriminating appreciation and understanding of the humanities, fine arts and philosophical ideas. This pattern is intended to develop standards of critical judgment, ability to assess and evaluate humanistic

ideas and values, and competence in the basic arts of communication and self-expression.

Social and Behavioral Sciences

Aerospace Studies, Agribusiness, Anthropology-ASB, Business Administration, Communication, Criminal Justice, Cultural Geography, Design Sciences, Economics, Educational Foundations, Engineering, Health Education, History, Home Economics, Journalism and Telecommunication, Leisure Studies, Military Science, Planning, Political Science, Psychology-PGS, Public Affairs, Recreation-REC, Sociology.

Students select with the advisor's approval two or more courses within the social and behavioral sciences. This pattern is designed to expand knowledge and appreciation of American and other cultures; to estimate the impact of science, technology, and changing business and economic conditions on human societies; and to increase awareness of the major social issues of the time.

Science and Mathematics

Anthropology-ASM, Botany, Chemistry, Computer Science, Engineering, Geology, Mathematics, Physical Geography, Physics, Psychology-PSY, Zoology.

Students select with the advisor's approval two or more courses, one or more of which must have a laboratory. These selections comprise a coherent pattern designed to explore the fundamental concepts of science and mathematics; to reveal the role of observation and experiment, inductive and deductive reasoning, and the quantitative approach in modern physical, biological and engineering science; and to bring into sharp focus the scientific forces that influence their destiny.

To complete the total credit hours requirement in General Studies, students with the advisor's approval shall select appropriate electives from the above fields or from other fields approved within the framework established by each college. Requirements in the three fields of General Studies may be met by advanced standing credit or may be waived by virtue of acceptable performance on a proficiency examination. In such cases, the prescribed requirements are correspondingly reduced by approval of the college. See College General Studies requirement for graduation.

Interdisciplinary Studies

Adult Development and Aging Program. Course work related to aging is currently offered in ten departments. An interdisciplinary Certificate in Gerontology may be earned by students who wish to study the psychological, sociological, and biological aspects of aging and the economic, political, legal, social, and health-related concerns of the older person. This interdisciplinary activity provides training for students who wish to work in a variety of gerontological occupations. It also gives students an opportunity to explore topics related to adult development and aging. A student in the Certificate Program majors in one of the currently existing university disciplines but takes individual course work in various departments which offer gerontology-related courses. For further information, contact Director, Adult Development and Aging Program.

City and Regional Planning. The city and regional planning focus provides undergraduate students of various disciplines a familiarity with this area's concerns, theories, and techniques. These draw from course offerings related to planning in various departments of the University (Planning, Geography, Geology, Civil Engineering, Public Affairs, Business Administration, History, Sociology, Home Economics).

Energy Studies. An expanding instructional and research involvement in energy matters exists through three curricular paths: (1) General Studies, which emphasize energy as an elective beyond the scope of a chosen major (for more information contact Chair, Department of Geography); (2) Specific studies in the Department of Planning (College of Architecture, usually for those pursuing the Master of Environmental Planning degree); (3) Specific studies in the College of Engineering and Applied Sciences, usually for those seeking a degree in a branch of Engineering.

Environmental Studies. The Center for Environmental Studies was established to initiate, coordinate and encourage research, community service, and academic programs. The Center does not formally offer courses or a degree program. It sponsors special courses, conferences and workshops on environmental topics. Drawing from faculty and students throughout the University, the Center participates in research and community programs relating to environmental problem areas.

Film Studies. The film studies program exists not only to provide information and experience but also to serve as a means of creative expression for the student and as a useful subject and tool in teaching. The program is not designed to produce professional filmmakers. However, it may provide practical preparation for students desiring further film study in other institutions.

Inquiries about this program should be directed to the Chair of the Interdisciplinary Film Committee or the Film Studies Advisor in participating colleges.

International Programs and Studies. International matters and an understanding of other nations are reflected in course offerings throughout the University. Special area emphases are coordinated through the Center for Asian Studies (page 57) and the Center for Latin American Studies (page 59). These two centers also publish quarterly journals, research reports, and scholarly monographs. The Hayden Library has extensive collections on international subjects in selected areas.

University academic year student exchange programs exist with universities located at Guadalajara, Hermosillo and Monterey in Mexico and at La Paz in Bolivia. Summer school programs in Guatemala and Europe are also available. Foreign students are also attracted annually to the intensive English training program offered by the American Language and Culture Program (page 23).

Islamic Studies. The art, history, geography and religion of the Islamic world are the subjects of several courses offered by departments in the Fine Arts and Liberal Arts Colleges.

Linguistics Studies. Interdisciplinary linguistics concentrations are offered in the Departments of Anthropology, English and Foreign Languages. There are numerous interdisciplinary linguistics courses in these and other departments. For information, contact the Chair of the Interdisciplinary Linguistics Committee.

Medieval and Renaissance Studies. Significant opportunities for the study of medieval and renaissance culture exist at Arizona State University. Hayden Library has an extensive microfilm collection and many rare books in medieval and renaissance studies. The Collegium Musicum, composed of graduate and undergraduate students, regularly presents public performances of medieval and renaissance music.

In addition, the Arizona Center for Medieval and Renaissance Studies (ACMRS) is housed in the College of Liberal Arts. The Center is a research unit composed of scholars from Arizona State University, Northern Arizona University and the University of Arizona. ACMRS enriches departmental offerings in medieval and renaissance studies by sponsoring one visiting professor for one semester each year. Graduate research assistantships are available through the Center. For information, contact Director, ACMRS, Social Science 224C, Arizona State University (965-5900). Scholars in ACMRS represent a variety of disciplines including history, literature, philosophy, religion, languages, music, art and science. For a list of advisors, see Interdisciplinary Studies in the College of Liberal Arts.

Women's Studies. An interdisciplinary perspective on women serves as the vehicle for a critical exploration of the role and status of past and present women, assumptions about women accepted in American culture, the validity of research on women, the effect on women of political, economic, and social systems, and the contributions of women to world culture. The student has the opportunity to consider alternative ways of looking at the assumptions that affect the image of women and to make a research contribution to the field. Inquiries about this program should be directed to the Director of Women's Studies, College of Liberal Arts, and the fall and spring Women's Studies brochure.

Registration

All persons attending a class must be registered for that class. A student is considered to be registered when all registration fees have been paid in full.

Eligibility. Only eligible students may register for courses at Arizona State University. An eligible student is either continuing from the previous semester or one who has been admitted or readmitted to the University (see Admissions, pages 19 and 24).

Advisement. Each college provides advisors who assist the student in planning a program of study and selecting courses for each semester. The student has the responsibility to seek advisement and to meet all the degree requirements.

Times of Registration. The dates, times and procedures for registration are published in the *Schedule of Classes.*

Proof of Identification. In order to receive University services, photo identification must be presented. Each admitted student who completes the registration process for a regular semester will be issued a student identification card. This photo identification card is valid for the duration of the student's enrollment at Arizona State University.

Photo IDs are issued throughout the semester in the Moeur Building. (Refer to page 30 for replacement fee.)

Activity Cards. Issued Fall and Spring semesters to students registered for 7 or more semester hours. The **original** validated fee receipt must be presented at the time of acquisition.

Registration Fees. Registration fees are due and must be paid in full at the time specified each semester in the *Schedule of Classes.* If any payment tendered is unauthorized, incomplete, or received after the due date, registration fees will be considered not paid.

Schedule of Classes. The *Schedule of Classes* is the official publication each semester and distributed without charge. The *Schedule* lists the semester's course offerings, dates, times, places, and procedures for registration, along with other important information relating to the semester.

Course Loads. A minimum full-time course load for an undergraduate student is 12 semester hours. The maximum course load for which a student may register is 18 semester hours (with the exception of a 19 hour maximum for students enrolled in the Colleges of Engineering and Applied Sciences or Architecture and Environmental Design). A student wishing to register for more than the maximum must petition the standards committee of the college in which he or she is enrolled and must have an approved overload petition on file with that college before registering.

Concurrent Enrollment. Provided that the other university regulations concerning enrollment, graduation requirements or transfer of credits are not violated, a student may be enrolled at other institutions and/or in correspondence courses, and/or off-campus classes while enrolled at Arizona State University. However, the student is urged to seek advisement prior to concurrent enrollment to assure orderly progress toward a degree. If total credits exceed

Enrollment Verification Guidelines. Arizona State University is frequently required to certify a student's enrollment as to full-time, part-time, etc. The following general guidelines are used primarily to verify enrollment for the purpose of loan deferments and eligibility. The Registrar is responsible for such verifications.

Regular Semester	Full-Time	Half-Time	Less Than Half-Time
Undergraduate	12 or more hours	6-11 hours	5 or less hours
Graduate	9 or more hours	5-8 hours	4 or less hours
Graduate Assistant	6 or more hours	---	---
Five Week Summer Session			
Undergraduate	4 or more hours	2-3 hours	1 hour
Graduate	3 or more hours	2 hours	1 hour
Graduate Assistant	2 or more hours	1 hour	---
Eight Week Summer Session			
Undergraduate	6 or more hours	3-5 hours	2 or less hours
Graduate	5 or more hours	3-4 hours	2 or less hours

the maximum course load, prior permission must be granted by the college standards committee. (See Course Loads, page 42).

Cooperative Education

Cooperative Education at Arizona State University is any educational program that requires *alternating classroom and work-experience* in government or industry. The work experience exists for its educational value and is under the guidance of a University employed coordinator.

1. *Full-time Status of Co-op Students.*

A Co-op student, during a work semester, is identified as both Co-op and full time by the University and in the Student Information System if he/she was full time during "cooperative education" course.

2. *Rights and Privileges of Co-op Students.*

During their work semester, Co-op students have the rights, privileges and protections, with regard to University matters, accorded to full-time students, except financial aid assistance. They will maintain catalog continuity and have student access to University facilities and events.

3. *Financial Aid for Co-op Students.*

Co-op students will not be identified to lenders (including ASU) as being in loan repayment status. They will have an *"In School" Full-time Enrollment Status.* Co-op students will not receive any financial aid disbursement during their Co-op semester *nor will such awards be transferred to another semester.* The student is responsible for notifying the Office of Student Financial Assistance as soon as plans for a Co-op term are made but no later than ten days before the Co-op term begins. The department or school is responsible for notifying the Office of Student Financial Assistance of students approved for Co-op terms until the Student Information System is changed to provide this data.

Traveling Scholar Program. The Traveling Scholar Program is a cooperative program between the three State universities designed to enable students to take advantage of programs or special resources that are not available at their own institution. Any undergraduate student with a 2.50 GPA or graduate student with a 3.00 GPA enrolled *full-time* at Arizona State University, Northern Arizona University or University of Arizona may be designated a Traveling Scholar by prior mutual agreement of the appropriate academic authorities at both the sponsoring and hosting institution. Contact the University Registrar for additional information and the application form.

Attendance. The instructor has full authority to make decisions whether class attendance is required.

Withdrawal from the University. There is only one procedure by which a student may officially withdraw from *all* classes after having paid registration fees. The student must initiate an official withdrawal from the University by appearing in person or by addressing a signed request to the Office of the Registrar, Arizona State University. No one will be permitted to withdraw from the University or conduct any registration transaction in the last two (2) weeks of the semester. (Complete withdrawal deadline dates pertinent to summer enrollment are displayed in the *Summer Session Bulletin.*) The date of the official withdrawal is always the date the withdrawal form or letter is received.

University Degree Requirements

Program of Study Requirements. Students must file an Undergraduate Program of Study for graduation within the semester they earn their 87th hour. Programs of Study and procedural information are available from the Graduation Office (Moeur Building 134 or any Registrar's Site).

The intention of the Policy is to guide the student in accomplishing successful completion of degree requirements in a timely manner. **Students who have not met the above requirement will be prevented from further registration.**

Application for Graduation Requirements. In the semester prior to graduation, students' application must be made by completing the following steps: (1) payment of graduation fee (University Cashiering Services) and, (2) submission of graduation fee receipt (Graduation Office, Moeur Building 134).

Students failing to comply with the above requirements will not graduate.

The Application for Graduation along with the Program of Study will be reviewed to verify graduation eligibility.

Credit Requirements. A minimum of 126 semester hours is required for graduation with a baccalaureate degree. A minimum of

fifty (50) semester hours in upper division courses is required for graduation.

Not more than 30 hours of credit in correspondence courses and/or by comprehensive examination will be accepted for credit toward the baccalaureate degree.

English Placement Examination. ENG 101 and 102 or ENG 105 are required for graduation from Arizona State University in any baccalaureate program. (See page 29.)

Transfer students from other Arizona colleges or universities can determine the acceptability of their English composition courses by referring to the most recent Arizona Commission for Postsecondary Education *Course Equivalency Guide.* Transfer students from out-of-state should file a petition with supporting documentation with the Director or Assistant Director of Freshman English. These petitions should be filed early enough for the student to be able to enroll in an additional composition course, if required to do so.

Grade Point Requirements. The minimum cumulative grade point average must be 2.00 for all courses taken at Arizona State University for a baccalaureate degree.

Resident Credit Requirements. Resident credit refers to a course which is offered in a regular semester or summer session. A minimum of 30 semester hours earned in resident credit courses at Arizona State University is required of every candidate for the baccalaureate degree. The final 12 semester hours immediately preceding graduation must be of resident credit.

Determination of Catalog Requirements. The *General Catalog* is published once every two years. Requirements for a department, or college, or the University as a whole may change and are often upgraded.

In determining graduation requirements, a student may use only one catalog.

A student whose attendance at the University has not been interrupted will graduate under the curriculum, course requirements, and regulations for graduation in effect at the time of admission to the University. A student may choose to graduate under any subsequent Catalog issued while the student is in continuous attendance.

A student who has been readmitted (page 24) will graduate under the curriculum, course requirements, and regulations for graduation as stated in the *Catalog* at the time of readmission or thereafter while in continuous attendance.

All other University policies and procedures, not related to curriculum or graduation requirements which are currently in effect, or which may subsequently change, are applicable to all students regardless of the catalog under which the student elects to be graduated. These policies and procedures may appear in the catalog or in other University publications.

Petition for Waiver of Degree Requirements.

Any student wishing to have a college or university degree requirement waived must petition the standards committee of the college in which the student is enrolled. In addition, waivers of university degree requirements must be approved by the University Standards Committee.

University Standards Committee. This committee advises the Office of the Vice President for Academic Affairs regarding undergraduate student petitions which concern university-wide academic requirements. These include but are not limited to requirements on the amount of transfer credit, graduation requirements, limits on credit by examination and requirements for a second baccalaureate degree. In order to petition for a waiver of such university requirements, the normal department and college forms and procedures will be used, prior to being forwarded to the Office of the Vice President for Academic Affairs.

General Graduation Information

Graduation with Academic Recognition. An undergraduate student must have completed at least 60 semester hours of resident credit at Arizona State University to qualify for graduation with academic recognition for each baccalaureate degree. A student with a cumulative grade point average of: 3.40 - 3.59 will graduate *cum laude,* 3.60 - 3.79 will graduate *magna cum laude,* and 3.80 - 4.00 will graduate *summa cum laude.* The cumulative grade point average for these designations will only include all course work taken at Arizona State University. All designations of graduation with academic recognition will be indicated on the diploma and the student's permanent record. Graduation with academic recognition applies only to undergraduate degrees.

Second Baccalaureate Degree. The student seeking a second baccalaureate degree must meet admission criteria for that degree. To obtain a second baccalaureate degree, a student must successfully complete a minimum of 30 additional hours of resident credit and must meet all degree and University requirements of the second degree.

More than one baccalaureate degree may be pursued concurrently, if prior approval is given by the standards committee(s) of the college(s) involved. In any case, a minimum of 30 additional hours is required.

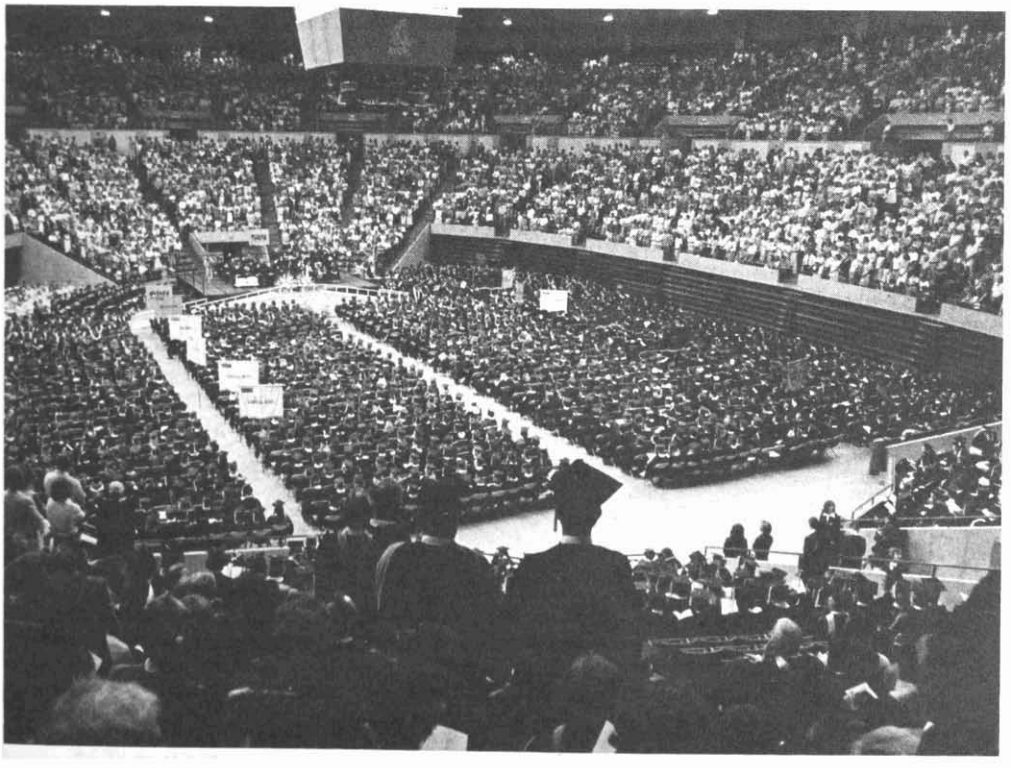
Graduate Degrees. See section of this *Catalog* headed "Graduate College" and "College of Law" for graduate degrees offered and statements of requirements for graduate degrees. A separate *Catalog* may be obtained from the Graduate College.

Applications for Teaching Certificates. Applications for teaching certificates should be obtained from the office of the Director of Student Services in the College of Education.

Western Interstate Commission for Higher Education (WICHE)

For Arizona residents who wish to attend professional schools of dentistry, veterinary medicine, occupational therapy, optometry, and osteopathy in one of the other western states, Arizona has joined with the other western states to create the Western Interstate Commission for Higher Education through whose effort and agency qualified Arizona residents may attend schools in these other states at essentially the same expense to the students as to residents of the state in which the school is located. Students must have maintained at least average grades in their pre-professional work and must have been legal residents of Arizona for at least the last five years. Recipients are required to return to Arizona to practice or to repay a portion of the funds expended in their behalf.

For further information and applications, interested students should contact Dr. Odus Elliott, Certification Officer, Arizona Board of Regents, 1535 West Jefferson, Phoenix, Arizona 85007, (602) 255-4082, or Dr. Brice W. Corder, Assistant Dean, College of Liberal Arts, Pre-Health Professions Office, SS 107, (602) 965-2365.



Student Services

Residence Life

The Office of Residence Life at Arizona State University coordinates the on-campus living environment for 6,000 students which includes residence halls, fraternities, and sororities. Residence Life strives to provide a safe, clean, economical, and convenient environment and to implement a comprehensive student development program.

Within their facilities, Residence Life recognizes the individual needs of students and programs. There are a variety of room plans for students. Choices of facilities range from small group housing to high-rise living to fraternity houses. Suite arrangements; single, double, and triple rooms; apartment; and special accommodations for disabled and graduate students provide additional options.

Residence hall living presents a unique opportunity for students to live and grow in a community consisting of individuals diverse in background, values, and aspirations, yet sharing the University experience and education. While an academic atmosphere conducive to study is fostered, the residence hall experience is heightened through a variety of activities designed to meet the emotional, intellectual, social, physical, spiritual, and career needs of the individual, as well as opportunities for leadership through the Residence Hall Association, Interfraternity Council, and Panhellenic Council.

Skilled professional and paraprofessional staff living in the residence halls are trained to implement these activities. They also strive to facilitate development of a sense of community within the living groups.

Application. Residence hall application information may be obtained from the Office of Residence Life, Memorial Union, Room 110. Students are *strongly encouraged to apply early*—at least six months in advance. Demand for on-campus housing exceeds supply. Only students admitted to the University may live in a residence hall; however, applications are accepted prior to official admission.

Residence hall assignments are made based upon the date of receipt in the Office of Residence Life, with the completed application, agreement, and a $50 deposit.

Application information contains a description of residence hall meal services. A variety of meal options is available.

Requests for specially modified rooms for disabled students should be noted on the application.

Student Health

This service is staffed by physicians, nurse practitioners, registered nurses, psychiatrists and health educators. A consultant dermatologist, gynecologist, neurologist, orthopedic surgeon and ear, nose and throat physician is available by appointment after referral by a staff physician. X-ray, laboratory, pharmacy, allergy clinic, self-care cold center, health education resource center, and extended women's health care services are also available.

Services are available during posted hours Monday-Saturday. Extended gynecological services and the PIES Wellness program offer evening options. Appointments are strongly recommended for the most efficient use of the services, however, urgent care is available. Student Health is an out-patient clinic and problems requiring hospitalization will be referred to local hospitals.

Costs to Students. Physician, nurse and nurse practitioner services are free of charge to full-time students (7 hrs. or more). Nominal fees are charged for students carrying less than 7 hrs. There are also minimal charges for the following: lab tests, X-rays and prescriptions. The expense of off-

campus consultants and hospitalization is assumed by the student.

Student Insurance. Insurance policies available through Student Health help defray the cost of accidents or any necessary hospitalization. Insurance coverage is mandatory for international students. All students enrolled at the University are eligible for student health insurance coverage which can be purchased during registration or through the Student Insurance Office located in Student Health. Dependents are not eligible for treatment at Student Health but are eligible for student health insurance coverage. Some form of health insurance is strongly recommended for all students.

Counseling and Consultation

A staff of psychologists is available for confidential interviews. Appointments may be made to discuss personal, vocational, academic and social concerns, understanding of self and evaluation of long-term goals. Increased self-understanding often offers students the opportunity to make more effective use of their intellectual and personal resources. Call or stop by the lower level of the Agriculture Building 112.

Counseling does not involve telling the student what to do; the student makes the decisions. Thus, emphasis is placed on the ultimate responsibility of individuals conducting their own lives and making the most of their opportunities.

Group counseling is also available. This allows students the opportunity to explore and share their problems with other students.

Counseling and Consultation does not offer academic course or program advisement. This is a service offered by faculty advisors.

Student Life

The Dean of Student Life and Student Life staff are concerned with the total development of the student. They provide programs and activities which will enhance the ASU educational experience. The office provides student assistance and referral, student leadership and organizational development. Program and service areas include student leadership, commuter programming, Child-Share, adult re-entry programming, a paraprofessional program, REACH, ASU Student Foundation, minority student organizations, Hispanic Mother/Daughter Program, academic honoraries, registration of student organizations, student conduct, exit interviews and graduate personnel internships.

Student Life works closely with the academic and student support service areas of the University to make sure students are aware of and use available resources. Staff members act as advisors, ombudspersons, and as liaisons with other departments. This office is one of the major information and referral points on campus and is located on the lower level of the Memorial Union, Room 48.

The Office of Career Services assists students and alumni in career planning, development and employment through a variety of services and provides vital resources to faculty and staff who advise students on career planning.

Workshops and classroom presentations are offered to present relevant information relating to career planning, employment research, and job hunting techniques. A reference room is available for individuals who want to familiarize themselves with career and employer information in order to make informed career choices and prepare for interviews. A Career Development Center has available computerized career planning systems to assist students in making and evaluating career choices.

Current part-time and summer listings are available, giving students the opportunity to earn an income while attending Arizona State University. The office also works with students, faculty, and employers to arrange part-time and summer work experiences in fields relating to the academic studies or career interests of students, to enhance career planning and the academic experience.

Graduating students are encouraged to register at least 2 semesters before graduating to fully participate in the placement related activities. The office works closely with businesses, school districts, industry, government, social service agencies, and health organizations in the placement of graduating students and alumni through on-campus interviewing and direct referral listings. Current job listings are maintained and published on a regular basis throughout the year.

Advisors are available to assist students on an individual basis with career and employment decisions year around. Students are encouraged to use the services throughout their academic experience.

Educational Development provides a major educational thrust for low income and ethnic minority students through its programs.

Disabled Student Resources. Educational support available includes academic, career and personal counseling, campus orientation, assistance with library research and adaptation of classroom materials, interpreters/notetakers, readers, testing, adapted recreation and physical education, as well as an intra-campus cart system and van transportation for educational needs.

Educational Opportunity Center. This community service of ASU focuses on low-income and ethnic minority clients. Clients receive career/vocational testing and guidance and are assisted in the procurement of admission and financial aid at an appropriate postsecondary institution. Services are free. EOC has a main office in central Phoenix and satellite offices around Maricopa County.

Minority Recruitment. Recruitment efforts are primarily directed at educational institutions with substantial ethnic minority enrollments. Assistance in the completion of applications for admission, housing and financial aid is provided along with information about orientation, registration, and other support services. The goal is to make the population of Arizona State University a "mirror of society."

Upward Bound. Upward Bound provides eligible high school participants an innovative and stimulating curriculum during his/her high school years. A specially-designed program for high school graduates which emphasizes practical university survival is included in the curriculum. The primary goal of Upward Bound is to provide the academic foundation for the successful transition to the college campus upon high school graduation.

Veterans Upward Bound. Efforts are directed to identify veterans who have not completed their secondary education or are not prepared for high education because of inadequate preparation and motivation. GED and college preparatory classes in the basic subject areas are available for veterans who need special training prior to entering a postsecondary institution.

Veterans Affairs Office

This office is a complete educational service center for U.S. Veterans and their eligible dependents. Counseling is available regarding admissions, registration, veterans benefits, and academic plus other advisement. Veterans programs serve the State of Arizona by advising all interested veterans and dependents regarding educational benefits and their optimum use. The program also assists veteran students to obtain suitable paid tutors, when needed, using their federal benefits.

Veterans must make adequate grade point averages and semester hour progress toward their academic program for continued educational benefits. The University must report this progress each semester. The Veterans G.I. Bill Office is located in Moeur Building 127, (602) 965-7723.

Associated Students

The Associated Students of Arizona State University is the student government for the University. Associated Students has a strong presence at the University in a variety of ways. It is the official representative of the student body in matters of University governance and budgeting.

Programs and services include: the Concert Series; Special Events; Film Series; Graduate Student Association; Faculty/Course Evaluation Program; Minority Affairs Board; Women Services; Lecture Series; Tenants and Commuter Students Association; Graphics and Advertising; Bike Co-op; Campus Services; College Councils and the Student Senate; Executive Committee; Intramurals/Club Sports/Recreation, including 60 intramural sports for men and women; and Legal Services.

Student Organizations

Student organizations offer the opportunity to participate in leadership experiences and to explore areas of specific interest. Students are encouraged to consider the values of membership in an organized group. Each of the approximately 300 existing student organizations has its own membership requirements and University advisor. More detailed information regarding these organizations may be obtained from the Dean of Student Life.

Student Activities

Listed below are some of the areas which provide programs and activities for students as participants or spectators.

Fraternities and Sororities. Sixteen sororities and 21 fraternities offer a range of op-

portunities for interested students. Programs are coordinated by the Interfraternity Council and Panhallenic Council to foster communication between houses, reward scholastic achievement, and promote university and community service projects.

Music. Performing organizations with the School of Music provide opportunities for involvement and credit, including symphony orchestra, bands, university choral organizations and Lyric Opera Theatre.

Dance. Programs and concerts are presented by members of the University Dance Theatre. Interested students should arrange to audition.

Forensics. A Sun Devil Forensic squad, associated with Pi Kappa Delta, national forensic honorary, travels to trophy tournaments across the country. Permission of the Director of Forensics required.

Interpreters Theatre. Participants write, compile, and perform scripts for presentation in diverse on- and off-campus settings through the Department of Communication.

Theatre. The University Theatre presents six to ten faculty-directed productions and the Student Experimental Theatre produces six student-directed productions each year.

Religious Activities. Various religious centers representing most major religious denominations are available in Tempe and provide students with the opportunity to participate in programs of religious worship and to meet other students through social activities.

Intercollegiate Athletics. The University is a member of the National Collegiate Athletic Association, the Pacific Athletic Conference (PAC 10) and Western Collegiate Athletic Association. Under the regulations of the Board of Regents, the respective association or conference listed above, and the University, intercollegiate athletics at Arizona State University is governed by a board of faculty, students, and staff. Policies are administered by the Department of Intercollegiate Athletics. All athletic grants-in-aid and scholarships are administered by and coordinated with the Office of Student Financial Assistance and Intercollegiate Athletics.

Memorial Union

The Memorial Union is a community center for all members of the University campus—students, faculty, administration, staff, alumni and guests of the University. The Union offers a variety of essential services, conveniences and amenities as well as a diverse program of cultural, educational, social and recreational activities.

The building houses lounges (both TV and study), ballrooms, meeting rooms, a movie theatre, an art gallery, a recreation area with bowling, billiards and amusement games, and an activities center for personal and organizational support services. The Memorial Union Board is housed in the Activities Center and is responsible for programming activities within the building.

Diversified dining is provided for individual and group needs. Reservations for the use of the Memorial Union facilities are made in the Reservation Office. The MU Information Desk, "the information source on campus," also provides numerous services to the University community and general public.

College of Liberal Arts

Samuel A. Kirkpatrick, Ph.D.
Dean

The College of Liberal Arts provides the student with an opportunity to obtain a broad, balanced, liberal education. In order to guide his/her life intelligently in a highly complex and rapidly changing world, a person must have an understanding of modern science, of the roots of civilizations, of the nature of our present world, and of the expression of this world in literature, philosophy and the arts.

The Liberal Arts College attempts to develop the qualities of mind and impart the types of knowledge that will enable the student to understand the world in all its complexity and variety. As a consequence, the College does not, for the most part, offer training designed merely to prepare the student to take on a particular job; rather, it offers breadth and depth of education which will make the student attractive to employers in a great variety of private and public enterprises as well as prepare him or her for a culturally enriched life.

Within the framework of the curriculum, students, with the assistance of faculty advisors, determine their own progress to fit their particular aims. Vocational interests are taken into consideration within this context, and students may prepare for professional schools, graduate work, or particular careers. Final responsibility for meeting the requirements for graduation in a chosen field rests with the student.

Degrees

At the undergraduate level, instruction in the College of Liberal Arts offers programs leading to the degrees of Bachelor of Arts and Bachelor of Science.

The curricula for these degrees are designed to give the student a broad, general background in the principal fields of human knowledge and at the same time provide for a reasonable amount of specialized training in a selected area. The curriculum for the Bachelor of Arts degree emphasizes breadth of studies, while the curriculum for the Bachelor of Science degree permits a somewhat greater extent of specialization in a selected area of scientific endeavor.

Admission to College of Liberal Arts

Any student who has met the minimum requirements for admission to the University (see pages 19-24) and who wishes to major in a subject offered within the College of Liberal Arts, or who is undecided about a major, will be admitted to the College of Liberal Arts.

Any student with a cumulative grade point average of at least 2.0 who is currently registered in another college at Arizona State University and who wishes to major in a subject offered within the College of Liberal Arts may transfer into the College by making application in the Dean's Office, Social Sciences Building, Room 111.

Transfer Credits

Students from accredited four-year institutions of higher education ordinarily will be given credit, hour for hour, for work successfully completed in such institutions insofar as it applies to the requirements for the curriculum pursued at Arizona State University. Such credit will be accepted at the level indicated on the transcript of the transferring institution.

Courses transferred from two-year (community) colleges will not be accepted as upper-division credit. Students are urged to choose their community college courses carefully, in view of the fact that a minimum of 50 semester hours of work taken at the University must be upper-division credit (see page 43).

Majors. Programs leading to the Bachelor of Arts and Bachelor of Science degrees are offered by the College of Liberal Arts, with majors in the following subjects. Each major is administered by the academic department indicated.

MAJOR FIELD	DEGREE	DEPARTMENT
Anthropology	(B.A.)	Anthropology
Asian Languages (Chinese/Japanese)	(B.A.)	Foreign Languages
Biology	(B.S.)	Botany and Microbiology; Zoology
Botany	(B.S.)	Botany and Microbiology
Chemistry	(B.A.,B.S.)	Chemistry
Clinical Laboratory Sciences	(B.S.)	Botany and Microbiology
Computer Science†	(B.S.)	Computer Science
Economics*	(B.A.,B.S.)	Economics
English	(B.A.)	English
French	(B.A.)	Foreign Languages
Geography	(B.A.,B.S.)	Geography
Geology	(B.A.,B.S.)	Geology
German	(B.A.)	Foreign Languages
Health Science	(B.S.)	Health and Physical Education
History	(B.A.,B.S.)	History
Home Economics	(B.A.,B.S.)	Home Economics
Humanities	(B.A.)	Humanities Program
Interdisciplinary Studies	(B.A.,B.S.)	Interdisciplinary
Italian	(B.A.)	Foreign Languages
Mathematics	(B.A.,B.S.)	Mathematics
Microbiology	(B.S.)	Botany and Microbiology
Philosophy	(B.A.)	Philosophy
Physical Education	(B.S.)	Health and Physical Education
Physics	(B.S.)	Physics
Political Science	(B.A.,B.S.)	Political Science
Psychology	(B.A.,B.S.)	Psychology
Religious Studies	(B.A.)	Religious Studies
Russian	(B.A.)	Foreign Languages
Sociology	(B.A.,B.S.)	Sociology
Spanish	(B.A.)	Foreign Languages
Speech and Hearing Science	(B.S.)	Speech and Hearing Science
Wildlife Biology	(B.S.)	Zoology
Women's Studies	(B.A.,B.S.)	Center for Women's Studies
Zoology	(B.S.)	Zoology

†The Department of Computer Science is located administratively in the College of Engineering and Applied Sciences. The Bachelor of Science degree with a major in Computer Science is offered by both the College of Liberal Arts and the College of Engineering and Applied Sciences. Requirements differ according to college (see page 77 and page 221).

*The Department of Economics is located administratively in the College of Business. The baccalaureate degree with a major in Economics is offered by both the College of Liberal Arts and the College of Business. Requirements differ according to college (see page 77 and page 171).

Five-Year Liberal Arts-MBA Plan

A capable and academically well-qualified Liberal Arts freshman may, by careful selection of electives, plan a course of study which will lead to a master's degree in business administration with only one year of additional study beyond the bachelor of arts or bachelor of science degree in a Liberal Arts subject. For more detailed information, consult an advisor in the Liberal Arts College Student Academic Affairs Office, Social Sciences 111, or telephone 965-6506.

Teacher Certification for Liberal Arts Majors-Secondary Education. A Liberal Arts student may obtain a Bachelor of Arts or a Bachelor of Science degree in Liberal Arts and meet the State of Arizona requirements for teaching certification in Secondary Education. The student must meet all requirements established by the Arizona Department of Education, including professional education courses and directed teaching, and all the college and departmental requirements for the major degree program in the College of Liberal Arts. For further information regarding the curriculum or certification the student may consult the Department of Secondary Education, Office of Student Services, in Payne Hall (Ed B-2). The curriculum leading to the Bachelor of Arts in Education is described in this catalog on pages 190-194.

Advisement

Regular Advisement. A prospective student who already has selected a major field of specialization will ordinarily be assigned to an advisor selected from the faculty of the department offering that field. Questions relating to the assignment of an advisor should be taken either to the departmental office or to the Coordinator of Advisement, College of Liberal Arts, Social Sciences Building 111.

"Undecided" or "undeclared" majors. Students in the College of Liberal Arts are not required to select a major upon entering

Advisement for Other Pre-Professional Programs

A student who plans to enter one of the baccalaureate degree programs in the College of Liberal Arts, and who also plans to pursue post-graduate training in a professional field, will ordinarily be assigned an advisor from the faculty of the department of his/her major field of study. Special advisement is available for students planning to enter the following fields:

Professional Field	Office Where Advisor Is Located
Bilingual Secretarial	Department of Foreign Languages
Dentistry*	Pre-Health Professions, SS 107
Foreign Service	Department of chosen major
Health Physics	Pre-Health Professions, SS107
Law†	Student Academic Affairs Office, SS 111
Master of Business Administration	Student Academic Affairs Office, SS 111
Medicine*	Pre-Health Professions, SS 107
Ministry	Department of Philosophy
Occupational Therapy*	Pre-Health Professions, SS 107
Optometry*	Pre-Health Professions, SS 107
Osteopathy*	Pre-Health Professions, SS 107
Pharmacy*	Pre-Health Professions, SS 107
Physical Therapy*	Pre-Health Professions, SS 107
Podiatry*	Pre-Health Professions, SS 107

These professional programs are not majors in themselves; that is, there are no majors called "pre-medical," "pre-law," etc. In each program the student must eventually select an established major in the College of Liberal Arts or in one of the other colleges.

*Students preparing for a career in these areas should register with the Secretary in the Office of Pre-Health Professions. No school in the State of Arizona offers a program in Dentistry, Occupational Therapy, Optometry, Osteopathy, or Podiatry. Students interested in pursuing these professions should confer with the pre-health professions advisor concerning out-of-state schools where they may complete their training.

†Students preparing for a career in law should register in SS 111.

the college as freshmen or at any time thereafter until the semester in which 60 semester hours are earned. Until such students have chosen a major they will be assigned advisors through the Student Academic Affairs Office of the College of Liberal Arts, located in the Social Sciences Building, Room 111. During the semester in which they earn 60 credit hours, or before, students in consultation with their advisors select their majors and transfer into the appropriate department. Thereafter, they receive advisement from a faculty advisor in that department. NOTE: Students who wish to enter a program of study which has a rigidly structured curriculum should be aware that delay in choosing a major initially could result in added time and cost in completion of requirements.

Program of Studies

Students construct their own programs of studies in accordance with the degree requirements set forth below.

Advisement and academic counseling are freely available both in academic departments and in the Student Academic Affairs Office of the College of Liberal Arts: however, it is the student's responsibility to be aware of the requirements for a degree program and to plan course selections accordingly, giving due regard to prerequisite courses.

Chains of Prerequisites. Prerequisite course numbers marked with a dagger (†) have further prerequisites. Each student is cautioned to be aware of the existence of such chains of prerequisites and to plan course selections accordingly. Failure to heed this warning may result in extra time and expense to complete degree requirements.

Degree Requirements

Course Load. The normal course load is 15-16 semester hours of credit. First-semester freshmen and entering transfer students are not permitted to register for more than 18 hours of credit in their initial semester. Other students who wish to register for more than 18 hours must have an average of at least 3.0 and must file a petition in the Student Academic Affairs Office, Social Sciences 111. Any petition for an overload in excess of 21 hours must be presented to the Standards Committee of the College. Unauthorized excess hours will be removed at random from the student's class list by administrative action.

Credit Requirement. All candidates for graduation in the Bachelor of Arts and Bachelor of Science degree curricula are required to present at least 126 semester hours of credit, of which at least 50 hours must consist of upper-division courses. A cumulative grade point index of 2.00 is required for graduation.

English Proficiency Requirement. All students must demonstrate reasonable proficiency in written English. A student who receives a grade of "C" or better in both ENG 101 and ENG 102, or in ENG 105 or their equivalents, will be presumed to have demonstrated the necessary degree of writing proficiency. Students who receive a "D" in any First Year Composition course must successfully complete a written English Proficiency Examination. The examination will be given at least twice a year, and a student must take it during the semester immediately following the completion of ENG 102 or ENG 105 or the equivalent. A student who does not complete the examination successfully on the first try must enroll in an English course prescribed by the Director of Freshman English. A student who receives a grade of "C" or better in such a course will be considered to have satisfied the proficiency requirement. Otherwise, students must repeat the above procedure until they have demonstrated the necessary degree of writing proficiency. Any questions concerning the English Proficiency Requirement should be addressed to the Director of Freshman English. Foreign students whose native language is not English may substitute ENG 107, ENG 108 for ENG 101, ENG 102.

Foreign Language Requirement. For the degree of Bachelor of Arts, the College of Liberal Arts requires knowledge of one foreign language equivalent to the completion of two years' study at the college level. A student who desires to fulfill the requirement in whole or in part through foreign language study in secondary schools may do so in accordance with the equivalency principles explained under Foreign Languages, Placement, page 83. Students who transfer from other colleges with less than two years of credit in a foreign language will be placed in a course at the next level above the work completed.

The foreign language requirement can be met in languages not taught at Arizona State

University either by transferring credit from another institution or by passing a proficiency examination. When possible, the Department of Foreign Languages will recommend an appropriate source for such examinations, and will proctor them. Grading will be done by the institution that provides the examination, and the student will pay any costs incurred. The examination can be used only to demonstrate proficiency; it does not produce credit hours.

Students who have received their secondary education from a school where the language of instruction was other than English will be considered to have satisfied the foreign language requirement. Certification of this status will be made at the time of admission to Arizona State University. Questions should be addressed to the Foreign Credentials Evaluator in the Admissions Office.

The College of Liberal Arts does not require knowledge of a foreign language for the degree of Bachelor of Science. Some departmental curricula leading to the Bachelor of Science degree do, however, include knowledge of a foreign language among their degree requirements. Foreign languages taken to fulfill a departmental requirement for the Bachelor of Science degree may be used to satisfy the minimum General Studies requirement in Humanities and Fine Arts.

General Studies Requirement

In order to obtain a baccalaureate degree through the College of Liberal Arts, the student must take a minimum of 54 semester hours of credit in the subjects and areas listed below. Courses in the subject field of the major may not be used toward this requirement, but courses in related fields may be used even if they are considered to be part of the major requirement. Pass-Fail credit cannot be used for these courses.

The General Studies requirement for the College of Liberal Arts is more extensive than the minimum requirement for graduation from the University (see page 39). The latter requirement will automatically be fulfilled by any student who completes the requirement for Liberal Arts.

To assure breadth within the degree requirements, all Liberal Arts students must meet the following minimum distribution patterns in the following three areas:

1) Humanities and Fine Arts—12 semester hours,
2) Social and Behavioral Sciences—12 semester hours,
3) Science and Mathematics—12 semester hours,

and additional courses selected from the lists below for the total of 54 credits. Courses offered by any single department—ASB/ASM, GCU/GPH and PGS/PSY—may not be used to satisfy minimum requirements in two different areas, i.e., Social and Behavioral Sciences *and* Science and Mathematics.

Humanities and Fine Arts. Only courses offered by the following departments may be used toward fulfilling the minimum 12-hour requirement.

- Architecture (APH courses and their cross-listed equivalents *only*)
- Art (ARH courses *only*)
- Communication (COM 241 *only*)
- Dance (DAH courses *only*)
- English (any course except ENG 101, 102, 105, 107, 108)
- Foreign Languages (any course except those below 300 used to satisfy the language requirement for the Bachelor of Arts degree)
- Humanities (HUM and HUP 318 *only*)
- Music (MHL, MTC; MUS except performance courses *only*)
- Philosophy (all PHI and HPS courses)
- Religious Studies
- Theatre (THE courses *only*)

Social and Behavioral Sciences. Only courses offered by the following departments may be used toward fulfilling the minimum 12-hour requirement.

- Anthropology (ASB courses *only*)
- Economics
- Geography, Cultural (GCU courses *only*)
- History
- Political Science
- Psychology (PGS courses *only*)
- Sociology
- Women's Studies (WST 100 and 300 *only*)

Science and Mathematics. Only courses offered by the following departments may be used toward fulfilling the minimum 12-hour requirement. At least one course must include a scheduled laboratory of at least 30 class hours per semester in a natural science. At least six hours must be taken in one department.

- Anthropology (ASM courses *only*)
- Botany and Microbiology (all BIO, BOT, and MIC courses)
- Chemistry

Computer Science (CSC 100, 101, 180, 181, 183, 200, 210, 304, 305, 383, 483 only: may not be used to satisfy laboratory requirement)

Geography, Physical (GPH courses *only*)

Geology

Mathematics (MAT and STP courses *only*; may not be used to satisfy laboratory requirement)

Physics (PHY, AST, and PHS courses *only*)

Psychology (PSY courses *only*)

Zoology (all BIO, ENT, and ZOL courses)

Additional Courses. To complete the 54-hour requirement, additional courses may be taken from the lists above, and from the following optional group:

Aerospace Studies (maximum of 6 hours of ROTC credit)

Art (except ARE)

Communication

Dance (DAN 130, 230, 330 *only*; a maximum of 4 hours in DAN and PED activities courses).

Health and Physical Education (HES 100, 382; PED 105, 205, 305 [a maximum of 4 hours in PED and DAN activities courses]; PED 450 *only*).

Home Economics (CDE 232; FON 141; FAS 330, 331, 354, 357, 435; TXC 122, 424 *only*)

Interdisciplinary (LIA courses in Liberal Arts, see page 109)

Journalism and Telecommunication

Justice Studies (maximum of 6 hours)

Leisure Studies (REC 160 only)

Military Science (maximum of 6 hours ROTC credit)

Music (except MUE)

Social Work (SWU 474 *only*)

Speech and Hearing Science

Theatre

Women's Studies

Major. Each candidate for the degree of Bachelor of Arts or Bachelor of Science must complete requirements for a major, as established by the department concerned. The specific course content of the major is selected by the student in consultation with the advisor under the rules and regulations of the department.

For the degree of Bachelor of Arts, the major and related fields requirement consists of a total of 45 semester hours of credit. A maximum of up to 36 semester hours may be required in the subject field of the major. Students should consult departmental listings for specific requirements in major and related fields.

For the degree of Bachelor of Science, the major may require a maximum of 45 semester hours of credit in the subject field of the major, plus additional related studies.

No credit will be granted toward fulfilling major requirements in any upper division course in the subject field of the major unless the grade in that course is at least a "C".

Special Credit Options

Pass/Fail Grade Option

I. The Pass/Fail option is intended to broaden the education of Liberal Arts undergraduates by encouraging them to take advanced courses outside their specialization. A mark of "P" contributes to the student's earned hours but does not affect the grade point average. A failing grade is computed into the GPA.

II. Only Liberal Arts students with 60 hours of credit may take courses under the Pass/Fail option.

III. The option may be used under the following conditions:

1. Enrollment for Pass/Fail must be indicated during registration and may *not* be changed after the late registration period.

2. Students may *not* enroll for Pass/Fail in courses which are:
   a) Taken to satisfy the Foreign Language or English Proficiency requirements.
   b) In the student's major.
   c) Counted toward or required to supplement the major.
   d) Counted as Independent Study 499.
   e) Taken for Honors credit.
   f) Counted toward satisfying the 54 hours of General Studies.

3. A maximum of 12 hours taken for Pass/Fail may be counted toward graduation.

IV. Above option is not available to Liberal Arts students for courses offered by other colleges except for courses in economics offered by the College of Business.

Academic Standards and Retention

Standards. The College of Liberal Arts standards for grade point average (GPA) and the terms of probation, disqualification, reinstatement, and appeal are identical with those of the University as set forth on page

37 of this catalog, except that the disqualified student is suspended for at least *two* regular semesters at the University.

Academic discipline is one of the functions of the Student Academic Affairs Office, Social Sciences Building, Room 111. All students who are having academic difficulties of any kind should maintain close contact with this office.

Probation and Disqualification. Appeals with respect to academic probation or disqualification may be addressed to the Academic Standards Committee of the College of Liberal Arts. Petitions should be submitted to the Student Academic Affairs Office, Social Sciences Building, Room 111.

Special Programs

Honors Program. The College of Liberal Arts provides a full four-year Honors Program which affords the superior undergraduate with opportunities for an enhanced liberal arts education and in-depth experiences in his or her major field. Characteristic of the program is the personal attention given to each student by members of the Honors Faculty, who are selected from among the leading scholars and teachers in the College. In instructing specially-designed Honors courses, and in supervising individual study and honors theses, the faculty share an enthusiasm for working with talented and motivated students. Beginning Fall, 1985, the honors program is available to all students in the University, regardless of the major.

Admission to the Honors Program:

Entering Freshmen. *Entering freshmen who* are in the top 5% of their high school graduating class, or who have an ACT composite score of 27 or better, or who can demonstrate similar indications of academic aptitude, are invited to apply for admission to the program upon entrance.

Continuing and Transfer Students. *A continuing or transfer student who has* completed at least 15 credit hours of study with a 3.25 cumulative grade average or better may, with the recommendation of his or her academic advisor, apply for admission to the program.

Retention in the Honors Program. An Honors student must maintain exceptionally high standards of performance while in the program, demonstrating evidence of progress toward satisfying the requirements for graduation from the program (see below). It is expected that an Honors student will register for at least one Honors course each semester in order to obtain full benefit from the program. An Honors student may leave the program at any time. All courses taken while in the program will count toward graduation from the University.

Graduation With Honors. To graduate with Honors, a student must:

Attain a cumulative grade average of at least 3.40;
Satisfy departmental major requirements, including major honors requirements where they exist, and relevant College General Studies requirements;
Complete a minimum of 18 hours of Honors credit, of which at most 6 can be XXX-493 (Honors Thesis), and of which at least 6 must be upper-division credit in non-major areas;
Write a senior thesis and pass an oral thesis defense.

For additional information, the interested student should contact the Director, Honors Program, College of Liberal Arts, PSA 326.

Interdisciplinary Studies

Interdisciplinary Studies Major. The Inter*disciplinary Studies major* leading to the B.A./B.S. degree provides students of outstanding ability in the humanities, social sciences, and natural sciences the opportunity to pursue courses of studies that cut across departmental boundaries but that nonetheless have coherence by focusing on specific topics or problem areas.

Administration. The major is overseen by the Director of the Honors Program who appoints individual committees of three persons with relevant areas of expertise to serve as advisors to each person pursuing this major.

Admission to the Program. Admission to the Program requires a 3.0 GPA in 32 semester hours of university work and three letters of recommendation from ASU faculty. Before seeking admission to the program, students should have a clear idea of the nature of the work they desire to pursue.

Degree Requirements. The major consists of:

A. 45 semester hours, distributed as follows:
1. The specific courses that meet the minimum core requirements in any one discipline; this ranges from 18 to 30 semester hours.

2. Fifteen to 27 semester hours of other courses that complement the disciplinary core so as to constitute a coherent interdisciplinary program.
These course requirements must be worked out with the advisory committee before the student begins pursuing the major.

B. Six additional semester hours of thesis work under the direct supervision of the advisory committee. The product (normally written) is to display and demonstrate the specific focus and goals of the students's program.

For additional information, the interested student should contact the Director, Honors Program, College of Liberal Arts. PSA 326.

Asian Studies. The Center for Asian Studies is designed to encourage and coordinate student, faculty and community study of the area through the support of public lectures, symposia, research and curricular development. Interdisciplinary programs have been developed, both undergraduate and graduate, to prepare students for governmental or private employment or for admission to graduate programs at other institutions.

At the undergraduate level, programs can be devised leading to an emphasis within a major. Example: History-Asian Studies, Anthropology-Asian Studies. Any department in the University may, at its discretion, accept an Asian Studies component. The goal is to offer programs which, while insuring a rigorous training for students in their chosen field of study, will enable them to relate their discipline to Asian conditions and problems.

The requirements for Asian Studies in such an emphasis are 30 semester hours of wholly Asian content courses, and knowledge of an Asian language. The 30 semester hours of Asian courses shall be selected from the list of Asian courses drawn up by the Center. These courses may be used where appropriate to fulfill General Studies requirements. Knowledge of an Asian language shall comprise the equivalent of 20 semester hours of credit in Chinese, Japanese, or any other Asian language approved by the Center for a particular individual program. Fulfillment of these requirements will be recognized on the transcript by a bachelor's degree with a major in "(Discipline)-Asian Studies."

At the graduate level, the Center for Asian Studies cooperates with a number of departments in master's and doctoral programs. At the M.A. and Ph.D. levels the cooperating departments are Political Science, History, Anthropology, Geography and Sociology. At the M.A. level only, the departments include Foreign Languages, Philosophy and Religious Studies. In cooperation with the College of Education, the Center offers two graduate programs to prepare teachers of Asian Studies for the high schools and community colleges. One program is the Master in Education—Secondary Education with a major field in Asian Studies consisting of 30 credit hours: 15 each in Asian Studies and Education. The other is Teaching Specialist in Asian Studies (within the Education Specialist degree program), which requires 36 hours beyond the M.A. degree: 18 each in Asian Studies and Education. Consult the Chair of the Secondary Education Department or the Director of the Center.

The Center cooperates and coordinates with other university centers in the summer or in one-year study programs in several Asian countries.

The Center also publishes an internationally recognized monograph series and symposium proceedings, all of which are distributed throughout the world.

For further information consult the Director of the Center for Asian Studies.

Asian Studies Courses. *For course descriptions refer to the course offerings by departments.*

ARH	201	Non-Western Art
ARH	294	Special Topics, where appropriate
ARH	470	Art of India
ARH	471	Art of China
	472	Art of Japan
ARH	474	Chinese Painting
ARH	494	Special Topics, where appropriate
ARH	498	Pro-Seminar, Chinese Art/Islamic Art
ARH	591	Seminar, Chinese Art/Islamic Art
ARH	598	Special Topics
ASB	323	Peoples of Asia
ASB	324	Peoples of the Pacific
ASB	325	Peoples of Southeast Asia
CHI	101	Elementary Chinese, 102
CHI	107	Chinese International Professions, 207
CHI	201	Intermediate Chinese, 202
CHI	205	Chinese Calligraphy
CHI	294	Special Classes
CHI	309	Chinese Conversation, 310, 311, 312

CHI 313 Advanced Chinese, 314
CHI 321 Chinese Literature, 322
CHI 413 Introduction to Classical Chinese, 414
CHI 492 Special Courses, 493
COM 263 Elements of Intercultural Communication
COM 363 Intercultural Communication Processes
COM 494 Special Topics
ECN 436 International Trade Theory
ECN 536 International Economic Theory
FLA 420 Foreign Literature in Translation: One Chinese Section
FLA 150 East Asian Cultures
FLA 420 Foreign Literature in Translation: One Japanese Section One Chinese Section
GCU 326 Geography of Asia
GCU 332 Geography of Australia/Oceana
GCU 428 Geography of the Middle East
GCU 431 Geography of the Far East
HIS 105 China: Literature and Revolution
HIS 106 The People's Republic of China
HIS 305 Asian Civilization, 306
HIS 470 Chinese Cultural History
HIS 471 Diplomatic History of East Asia, 472
HIS 473 China, 474
HIS 494 Special Topics
HIS 476 Modern Southeast Asia
HIS 477 Japan, 478
HIS 479 The Chinese Communist Movement
HIS 494 Special Topics: Asian History
HIS 498 Pro-Seminars on Modern China and Japan
HIS 590 Reading and Conference: China
HIS 591 Seminar: China
JPN 101 Elementary Japanese, 102
JPN 107 Japanese Internat'l Professions, 207
JPN 201 Intermediate Japanese, 202
JPN 206 Calligraphy
JPN 294 Special Courses
JPN 309 Intermediate Japanese Conversation, 310
JPN 311 Japanese Conversation, 312
JPN 313 Advanced Japanese, 314
JPN 321 Japanese Literature, 322
JPN 414 Introduction to Classical Japanese
JPN 492 Special Courses, 493, 494, 499, 590
MHL 544 World Music I
MHL 545 World Music II
PHI 319 I Introduction to Asian Philosophies, 320
POS 160 Global Politics
POS 360 Current Issues in International Politics: Asia
POS 445 Asian Political Thought
POS 448 Comparative Politics of China and Japan
POS 452 Government and Politics of China
POS 458 Government and Politics of South and Southeast Asia
POS 460 World Politics
POS 468 Comparative Asian Foreign Policies
POS 250 Special Courses, 492, 493, 498, 499, 590, 591, 598
REL 121 Religions of the World
REL 351 Hinduism and Buddhism
REL 352 Confucianism and Taosim
REL 451 Religions of India
REL 453 Zen
REL 454 Hindu Religious Thought
REL 455 The Religion in Japan
REL 494 Special Topics, 598
SOC 498 Pro-Seminar: Topics to be selected, 590, 592
THE 425 History of the Oriental Theatre

Health Physics. Health physics is a profession devoted to the protection of humans from potential radiation hazards. Health physicists are concerned with areas of activity in research, industry, education, and enforcement of governmental regulations. Some health physicists choose to specialize in only one of these areas, but most health physicists are engaged in all four.

The curriculum of Health Physics involves course work in the Colleges of Liberal Arts and of Engineering and Applied Sciences. The purpose of the concentration is to serve undergraduate students who wish to prepare themselves for a career in Health Physics. To qualify for professional status, a health physicist needs a Bachelor of Science degree in one of the physical or life sciences and a group of specialized courses in physics, mathematics, chemistry, engineering, and biology or zoology.

A Certificate of Concentration in Health Physics is awarded for the successful completion of a Bachelor of Science degree in a physical or life science which includes the following course work: MAT 270†, 271, 272 (or 290†, 291), 420, 274; PHY 115†, 117,

116, 118, 361; ECE 122†, BIO 181, 182; ZOL 360†; MEE 411†, 412, 417.

The following courses are recommended but not required: CHM 447†, 448; MEE 413; BIO 340†; ZOL 241. Any of the required or recommended courses may be used, where appropriate, to fulfill major field requirements, related field requirements, and General Studies requirements.

Inquiries about the program should be addressed to the Pre-Health Professions Office, Social Science Building 107, where academic advisement is available.

Islamic Studies. Although the Muslims of the Middle East and Africa are frequently in the news, the West has much to learn about their history and cultures. Arizona State University faculty members with special expertise in Islam offer courses in several departments, as well as an interdisciplinary course on Islamic Civilization. Numerous programs, guest speakers and art exhibitions on the Islamic world are brought to the campus. For further information, contact the Department of Religious Studies, LL B-605.

Islamic Studies Courses. *For course descriptions refer to the course offerings by departments.*

GCU	428	Geography of Middle East
HIS	437	Eastern Europe and the Balkans
HIS	439	The Modern Middle East
HIS	456	Iberian Empires
REL	310	Western Religious Traditions
REL	365	Islamic Civilization
REL	460	Studies in Islamic Religion
REL	464	Islamic Mysticism

ARA, HUP, or REL 365 Islamic Civilization Team-taught interdisciplinary course.

For special topics courses (494) and independent studies (499) on Islamic and Middle Eastern subjects, consult departments indicated above.

Jewish Studies. The Jewish Studies program is designed to 1) examine the history and culture of the Jews; 2) provide a model for interdisciplinary teaching and research; 3) generate and facilitate research on Judaica; 4) provide the community with programs, courses, and research furthering the understanding of Judaica; 5) stand as an example of the University's commitment to a program of meaningful ethnic studies on a firm academic base; and 6) provide a Certificate of Concentration in Jewish Studies.

The Certificate of Concentration in Jewish Studies may be combined with a major in any college. It consists of 21 hours, including REL 211 and six additional courses from the approved list, of which no more than two may be in the field of the major. The course of study must be approved by a member of the Jewish Studies Faculty Advisory Board. For information about the program refer to the Department of History or the Department of Religious Studies.

The following is a listing of Jewish Studies courses. For course descriptions refer to the course offerings by department.

REL	100	Religions of the World
REL	210	Introduction to Judaism
REL	310	Western Religious Traditions
REL	315	Hebrew Bible (Old Testament)
REL	316	Types of Early Judaism
REL	317	Introduction to Rabbinic Judaism
REL	320/ 381	Religion in America
REL	381	Religion and Moral Issues
REL	385	Contemporary Religious Thought
REL	415	Jewish Mystical Tradition
REL	445	Judaism in Modern Times
HIS	434	Hitler: Man and Legend
HIS	439	The Modern Middle East
HIS	494	European Jewry 1348-1789
SOC	498	Jewish Family
ENG	345	Jewish Fiction
ENG	345	Holocaust Literature
ENG	356	Biblical Backgrounds of Literature
FLA	294	Modern Hebrew
GED	428	Geography of the Middle East
ART	410	Ancient Near Eastern Art

For special topics courses (294, 394, 494) or independent studies (499) in Jewish Studies consult departments indicated above.

Latin American Area Studies. Arizona maintains an ever-growing interest in Latin America that draws upon an extensive experience of historical and geographical ties. The Center for Latin American Studies is the focal point for these interests at Arizona State University, and through its program endeavors to serve the University community and maintain strong ties with various Latin American organizations in the state and the nation. Principal activities are coordinating Latin American Studies at the undergraduate and graduate levels; sponsoring student exchange programs, numerous semi-

nars and conferences; publishing a wide range of professional materials; and facilitating research about the region.

The Latin American Area Studies program is designed to give students an understanding of public affairs, culture, and national trends in Latin American nations and is offered as a combined degree program in cooperation with the departments of Anthropology, Economics, Geography, History, Political Science, and Foreign Languages (Spanish), as well as the College of Business. In this program the student majors in one of the cooperating departments, completing the degree requirements of that particular discipline. At least 30 upper division semester hours of the total program must be in Latin American content courses, 15 hours in the major and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required. The 15 hours required in other disciplines shall be selected from the list of Latin American content courses established by the Center (a list of courses follows). The program must be approved by the Center for Latin American Studies. Fulfillment of the requirements of this program of study is recognized on the transcript as a bachelor's degree with a major in "(Discipline) — Latin American Studies."

Master's degree students in the departments of Geography, History, Political Science, or Spanish may elect an emphasis in the field of Latin America. Two departments, History and Foreign Languages, offer Latin American areas of focus at the Ph.D. level. A cognate minor in Latin American studies is also available in various disciplines.

The Center administers student exchange programs with the Catholic University of Bolivia and three Mexican universities—the Autonomous University of Guadalajara, the Autonomous University of Nuevo Leon, and the University of Sonora. Each semester several ASU students are selected to receive credit for course work taken on the Latin American campuses while Bolivian and Mexican students study here.

Each year the Center typically sponsors events featuring Latin American arts and culture, several major conferences as well as a number of seminars, often featuring presentations by scholars from Latin America. The Center regularly displays its extensive collection of Latin American folk art. The Center annually publishes several scholarly books as well as shorter monographs in its Special Studies Series.

The Center is a member of the Arizona-Mexico Commission, The Consortium of U.S. Research Programs for Mexico, the Consortium for Latin American Studies Programs, the Latin American Studies Association, the Rocky Mountain Council on Latin American Studies, and the Pacific Coast Council on Latin American Studies.

The Center directly encourages research, not only through its publications program, but also through the maintenance of a Latin American newspaper reading room.

For further information consult the office of the Center for Latin American Studies, Room 213, Social Sciences Building.

Latin American Content Courses. *For course descriptions refer to the course offerings by departments.*

ARH	403†	Pre-Columbian Art
ARH	408†	Pre-Columbian Art II
ARH	441†	Spain and Its Colonies 1500-1800
ASB	321†	Southwestern Indians
ASB	322†	Indians of Mexico
ASB	335	Pre-Hispanic Civilizations of Mesoamerica
ASB	335	Southwestern Anthropology
ASB	337	Archaeology of Mesoamerica
ASB	419†	Social Inequality
ASB	479†	The Anthropology of Peasant Peoples
ECN	331†	Comparative Economic Systems
ECN	360†	Economic Development
ECN	365†	International Economics
ECN	367†	Economics of Latin America
ECN	438†	International Monetary Economics
ECN	536†	International Economic Theory
ECN	538†	International Monetary Theory and Policy
ECN	561†	Economics of Developing Nations
GCU	323	Geography of Latin America
GCU	423†	Geography of South America
GCU	424†	Geography of Middle America
HIS	380	History of the Mexican American
HIS	383	Latin America, 384
HIS	424	The Hispanic Southwest
HIS	430	20th Century Chicano History
HIS	456	History of Spain, 457
HIS	458	Age of Conquest: Latin America
HIS	459	Changes and Reform: Colonial Latin America

HIS 460 Spanish South America, 461
HIS 463 Intellectual and Cultural History of Latin America
HIS 464 The United States and Latin America
HIS 466 Mexico, 467
HIS 468 Brazil
HIS 515 St: Latin American Historiography
IBS 300† International Business
LIS 465 Literature for Hispanic Youth/ Literatura para Jóvenes Hispanoparlantes.
MCE 448 The Mexican-American Child
MCE 498 Minority Women
MCO 430 International Communications
MGT 459† International Management
MGT 559 International Comparative Management
MHL 466 North American Indian Music
MHL 544 World Music I
MKT 435† International Marketing
POR 321† Luso-Brazilian Literature
POR 472† Luso-Brazilian Civilization
POS 438 Revolution and the Social System
POS 453 Government and Politics of South America
POS 454 Government and Politics of Mexico
POS 455 Government and Politics of Central America and the Caribbean
POS 460 World Politics
POS 463 Inter-American Relations
POS 465 International and Regional Organizations
POS 467 Comparative Defense Policy
POS 550 Comparative Governments
SOC 401 Comparative Sociology
SPA 325† Introduction to Hispanic Literature
SPA 421† Spanish in the Southwest
SPA 424† Masterpieces of Hispanic Literature
SPA 427† Spanish-American Literature, 428†
SPA 429 Mexican Literature
SPA 454† 19th Century Spanish-American Narrative
SPA 455† Spanish-American Modernism
SPA 456† 20th Century Spanish-American Fiction
SPA 457† Contemporary Spanish-American Poetry
SPA 464† Mexican-American Literature
SPA 471† Civilization of the Spanish Southwest
SPA 472† Spanish-American Civilization
SPA 485 Mexican-American Short Story
SPA 486 Mexican-American Novel
SPA 487 Mexican-American Theatre
SPA 541 Spanish Language in America
SPA 570 Indigenous Literature of Spanish America
SPA 571 Colonial Spanish-American Literature
SPA 572 Spanish-American Drama
SPA 573 Spanish-American Essay
SPA 574 Spanish-American Vanguard Poetry
SPA 575 Contemporary Spanish-American Novel
SPA 576 Contemporary Spanish-American Short Story
SPA 577 Regional Spanish-American Literature
SPA 578 Novel of the Mexican Revolution
SPA 579 18th Century Hispanic Literature
SPA 581 Latin American Popular Culture
SPF 533 Comparative Education in the Western World
SPF 534 Education and Change in Developing Nations
TRA 463† International Transportation

†Denotes prerequisites

Several departments offer additional Latin American content courses under the following designations: special topics 494, honors colloquium 497, pro-seminar 498, reading and conference 590, seminar 591, and special topics 598. Students should consult a schedule of classes for the availability of these courses. In addition, the University offers Latin American content courses for law students and doctoral students in several departments.

Medieval and Renaissance Studies. The Arizona Center for Medieval and Renaissance Studies (ACMRS) sponsors a visiting professor, postdoctoral fellow, graduate research assistantships, and conferences and symposia concerned with the Middle Ages and the Renaissance. This statewide Center, involving faculty at all three state universities, is an organized research unit housed by the College of Liberal Arts in Social Science 224. For further information contact the Director, ACMRS, SS 224, Arizona State University, Tempe, AZ 85287, 965-5900.

In recognition of the need for period as well as subject area specialization, faculty members with research interests in Medie-

val and/or Renaissance Studies offer a number of courses from which students may develop an interdisciplinary course of study in Medieval and/or Renaissance topics. Through individual university departments, courses are offered in history, philosophy, humanities, religious studies, music, art, and literature (English, French, German, Italian, Scandinavian, and Spanish). For specific course information and advisement, see the following Medieval and Renaissance advisors:

Art and Humanities	A. Gully
English	J. Brink
French	W. Hendrickson
German and Scandinavian	W. Senner
History	K. Dannenfeldt
History of Science	J. Maienschein
Italian	P. Baldini
Music	R. Reynolds
Philosophy	M. White
Religious Studies	R. Martin
Spanish	E. Friedman
Theatre	W. Akins

Center for Private and Public Sector Ethics. The Center for Private and Public Sector Ethics conducts research and offers educational programs on ethical issues in business, government, and the professions. The "Making Ethics Work" seminar series includes seminars for business managers, government managers, and medical and legal professionals. The Center offers programs on specific topics such as ethics for new technologies, ethics and international business, and organizational cultures and ethics. The research agenda of the Center focuses on the role of ethics in the functioning of various organizations and professions, on multi-disciplinary approaches to ethical problems, and on the foundations of organizational and professional ethics. The Center for Ethics is the sponsor of the Fund for New Technologies. This Fund works cooperatively with Centers at the University of Southern California, the University of California at Berkeley, and Stanford University to support projects on the ethical implications of new technologies. While the Center does not offer courses for undergraduate or graduate students, it designs programs for students with an interest in ethics in organizations or the professions. Students participate in Center programs in a variety of roles, and should contact the Center Director for further information.

Solid State Science. As a separate unit within the College of Liberal Arts, the Center for Solid State Science is engaged in research in many aspects of the physics and chemistry of solids as well as solid state devices. The Center operates modern research facilities, sponsors a colloquium series, maintains a library of research publications and works cooperatively with local industry. While the Center itself does not grant degrees, it does provide opportunities for both graduate and undergraduate students to do research in this cross-disciplinary area. Students would include this research activity as part of a program of study within one of the departments, normally physical sciences or engineering, under the supervision of one of the faculty members of the department or of the Center.

Women's Studies. The curriculum of Women's Studies involves courses from colleges throughout the University. The Women's Studies program is designed to:

1. Examine the central issue of the quality and shape of woman's experience;
2. Provide a model for interdisciplinary teaching and research;
3. Generate and facilitate research on women's experience;
4. Provide the University and the community with programs, courses and research which acknowledge and expand the potential of women; and
5. Stand as a visible example of the University's commitment to change in the status of women—students, faculty and staff—within the University and the larger society.

A Bachelor of Arts or Bachelor of Science degree may be awarded in Women's Studies. These programs are described on page 134.

A Certificate of Concentration in Women's Studies may be awarded for the successful completion of the introductory course, Women and Society, plus 18 additional credits from the list of approved Women's Studies courses, only six of which may also be applied toward the student's major. Credit for additional related courses may be accepted upon petition to the Women's Studies Advisory Committee.

For some students in the College of Liberal Arts, the courses in this concentration may be accepted as fulfilling the related field requirements. Students who wish to take ad-

vantage of this option should consult the Director.

Inquiries about the program should be addressed to the Women's Studies Resource Center, Social Sciences 103, where the current list of approved courses is available. See page 134.

Aerospace Studies

(Air Force ROTC)

PROFESSOR:
WAITE (MAIN 340)
ASSISTANT PROFESSORS:
STALEY, BONGARTS, ROGERS

Purpose. The Department of Aerospace Studies curriculum consists of the General Military Course for freshmen and sophomores (GMC-AES 101, 102, 201, 202) and the Professional Officer Course for juniors and seniors (POC-AES 301†, 302†, 401†, 402†). The goal of this professional education is to provide the foundation of military knowledge and skills needed by Air Force junior officers. Upon graduation, each student who satisfactorily completes the Professional Officer Course and degree requirements will receive a commission as a Second Lieutenant in the Air Force Reserve.

General Qualifications. Men or women entering AFROTC must: (1) be a citizen of the United States (noncitizens may enroll, but must obtain citizenship prior to commissioning); (2) be of sound physical condition; (3) be at least 17 years of age for scholarship appointment or admittance to the POC. Additionally, scholarship recipients must be able to fulfill commissioning requirements by age 25. If designated for flying training, the student must be able to complete all commissioning requirements prior to age 26½; other categories must be able to complete all commissioning requirements prior to age 30.

Four-Year Program (GMC and POC). A formal application is not required for students entering the Four-Year Program. A student may enter the program by simply registering for one of the General Military Course (GMC) classes at the same time and in the same manner as other courses. GMC students receive 2.0 semester hours of credit for each AES 100 and 200 class completed; a total of 8.0 semester hours. GMC students not on AFROTC scholarship incur no military obligation. Each candidate for commissioning must pass an Air Force aptitude test and a physical examination and be selected by an interview board of Air Force officers. If selected, the student then enrolls in the Professional Officer Course (POC), the last two years of the Air Force ROTC curriculum. Students attend a four-week field training course at an Air Force base normally between the sophomore and junior year. Upon successful completion of the POC and the college requirements for a degree, the student is commissioned in the U.S. Air Force as a Second Lieutenant. The new officer then enters active duty or may be granted an educational delay to pursue graduate work.

Two-Year Program (POC). The basic requirement for entry into the two-year program is that the student have two academic years of college work remaining, either at the undergraduate or graduate level. Applicants seeking enrollment in the two-year program must pass an Air Force aptitude and medical examination, and be selected by an interview board of Air Force officers. After successfully completing a six-week field training course at an Air Force base, the applicant may enroll in the Professional Officer Course in the Air Force ROTC program. Upon completion of the POC and the college requirements for a degree, the student is commissioned.

Qualifications for Admittance to the Professional Officer Course (POC). (1) For the four-year student, successfully complete the General Military Course. (2) For the two-year applicant, complete a six-week field training course. (3) Pass the Air Force Officer Qualification Test (AFOQT). (4) Pass the Air Force physical examination. (5) Maintain the minimum grade point average required by the college.

Deposit. All non-contract students registering for Air Force ROTC are required to make a deposit of $20 with the military property custodian as the basis for issue of the prescribed uniform, textbooks, and other authorized materials. This deposit will be refunded at the end of each school year or upon withdrawal from the AFROTC program, by the military property custodian.

Pay and Allowances. POC members in their junior and senior years receive $100 per month for a maximum of 20 months of Professional Officer Course attendance. Students are also paid to attend field training. In addition, uniforms, housing and meals are provided during field training at no cost to the student. Students are reimbursed for travel to and from field training.

Scholarships. Air Force ROTC offers scholarships annually to outstanding young men and women on a nationwide competitive basis. Scholarships cover full college tuition for resident and nonresident students as well as books, fees, supplies and equipment, plus a monthly tax-free allowance of $100. Scholarships are available on a 4-, 3½-, 3-, 2½-, and 2 year basis. To qualify for the four-year scholarship, students must be U.S. citizens and submit an application prior to December 15 of their senior year in high school. Interested students should consult their high school counselors or call AFROTC at ASU for application forms to be submitted to HQ, AFROTC, Maxwell AFB, AL, 36112-6663. Male and female students enrolled in AFROTC at Arizona State University are eligible for 3½-, 3-, 2½-, and 2 year scholarships. Those interested must apply through the Department of Aerospace Studies. Consideration is given to academic grades, score achieved on the Air Force Officer Qualifying Test and physical fitness. A board of officers considers an applicant's personality, character and leadership potential.

Flight Instruction Program. Cadets designated to enter U.S. Air Force Undergraduate Pilot Training after graduation participate in the Flight Instruction Program (FIP) during their junior year in college unless they already have a private pilot's license. Each cadet receives 12 hours of instruction at an FAA approved flying school at no expense to the student. This training also includes ground school instruction.

AEROSPACE STUDIES

AES 101 Aerospace Studies. (2) F
Introduction to U.S. Air Force organization, mission, doctrine, offensive and defensive forces. One lecture, 1 hour Leadership Practical Application (101L).

102 Aerospace Studies. (2) S
Background on strategic missile defense forces, general purpose and aerospace support forces in national defense. One lecture, 1 hour Leadership Practical Application (102L).

201 Aerospace Studies. (2) F
Historical survey of events, trends, and policies leading to the emergence of air power through WW II. One lecture, 1 hour Leadership Practical Application (201L).

202 Aerospace Studies. (2) S
Development of aerospace power from WW II to the present emphasizing the impact of limited war and technology on roles and missions. One lecture, 1 hour Leadership Practical Application (202L).

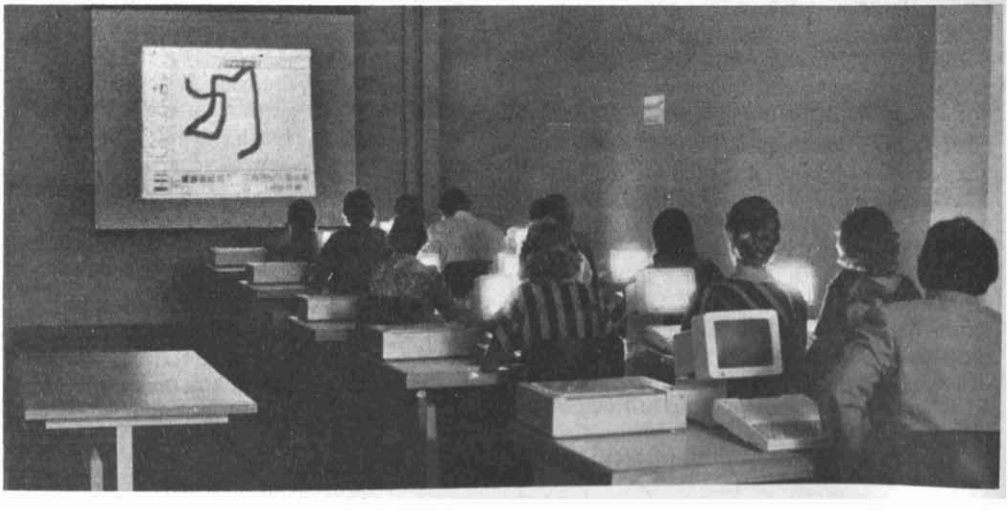
301 Aerospace Studies. (3) F
An integrated management course emphasizing the individual as a manager in an Air Force milieu. Individual motivational and behavioral processes, leadership, communication and group dynamics are covered. Two lectures, 1 hour Leadership Practical Application (301L).

302 Aerospace Studies. (3) S
Organizational and personal values, management of forces in change, organizational power, politics, managerial strategy and tactics. Two lectures, 1 hour Leadership Practical Application (302L).

401 Aerospace Studies. (3) F
Armed Forces as a technical element of society, with emphasis on the broad range of American civil-military relations; principles and techniques of communicative skills; the political, economic and social constraints on the national defense structure. Two lectures, 1 hour Leadership Practical Application (401L).

402 Aerospace Studies. (3) S
Formulation and implementation of U.S. defense policies; impact of technological and international developments on strategic preparedness in the overall defense policymaking processes. Two lectures, 1 hour Leadership Practical Application (402L).

403 Flight Instruction. (0) F,S
Flight instruction (12 total hours of dual and solo instruction); 8 hours ground school. Prerequisite: Enrollment in POC.



Anthropology

PROFESSORS:
FOSTER (ANTH A-124), BAHR, CLARK, DITTERT, MERBS, MORRIS, REDMAN, SCHOENWETTER, TURNER

ASSOCIATE PROFESSORS:
AGUILAR, BRANDT, EDER, FIRESTONE, GAINES, MARTIN, NASH, STARK, WILLIAMS

ASSISTANT PROFESSORS:
MARZKE, SMITH, STEADMAN

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Anthropology—Consists of 45 semester hours of credit of which 36 must be in anthropology and 9 in related fields to be approved by the advisor in consultation with the student. Course requirements are distributed as follows: (1) ASM 101 and ASB 102; (2) six hours including one 400-500 level course in each of (a) social-cultural anthropology, (b) physical anthropology, (c) archaeology; (3) three hours in each of (a) linguistics (b) ethnographic area course, (c) archaeology or physical anthorpology area course. Three of the nine hours in related fields must be in statistics. Each student's program of study must be approved by the advisor in consultation with the student. At least 18 semester hours must be in upper division courses. For details see Departmental brochure. (See foreign language requirement, page 53).

Latin American Studies Combined Degree Program. (See Interdisciplinary Studies, page 59)—Consists of the Bachelor of Arts degree requirements in Anthropology. At least 30 upper division semester hours of the total program must be in Latin American content courses including 15 hours in Anthropology and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a Bachelor of Arts degree with a major in Anthropology—Latin American Studies.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Social Studies: Anthropology—Consists of 63 semester hours of credit, of which 30 hours must be in the anthropology courses required for the Bachelor of Arts degree in Liberal Arts. Of the remaining hours, two groups of 15 hours are to be taken in related social sciences. Psychology or a single natural science may be used as one of the 15 hour fields. SED 480 is taken to provide the remaining 3 hours.

	Semester Hours
Anthropology	30
Social sciences	15
Social sciences or natural sciences or psychology	15
SED 480 (Special Methods of Teaching Social Studies)	3
	63

Departmental Minor Teaching Field Requirements

(Secondary Education)

Anthropology—Consists of 24 semester hours of credit in anthropology. Courses ASM 101, ASB 102, and two upper division courses in each subdisciplinary field (archaeology, physical anthropology, social-cultural anthropology) are required.

Departmental Graduate Program

The Department of Anthropology offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

ANTHROPOLOGY (ASM)

Courses which may be applied toward the General Studies requirement in sciences and mathematics.

ASM 101 Human Origins and the Development of Culture. (3) F, S
Physical anthropology and archaeology. Evidence and processes of human evolution and of culture change. Primates. Fossil hominids and their tools. Race, variation and heredity. Environment and human biology. Prehistoric culture and society.

241 Biology of Race. (3) F, S
Human variation and its interpretation in an evolutionary context.

338 Anthropological Field Session. (2-8) SS
Anthropological field techniques, analysis of data and preparation of field reports. Prerequisite: approval of instructor. May be repeated for credit.

341 Human Osteology. (4) F
Osteology, human paleontology, osteometry. Description and analysis of archaeological and contemporary human populations. Prerequisite: ASM 101 or approval of instructor. Three lectures, 3 hours laboratory.

342 Human Biological Variation. (4) S
Evolutionary interpretations of biological variation in living human populations with emphasis on anthropological genetics and adaptation. Nutrition and disease, and their relation to genetics and behavior. Prerequisites: ASM 101, MAT 106 or equivalent, or approval of instructor. Three lectures, 3 hours laboratory.

343 Primatology. (3) F
Evolution and adaptations of nonhuman primates emphasizing social behavior. Includes material from fossil evidence and field and laboratory studies in behavior and biology. Prerequisite: ASM 101 or approval of instructor.

344 Fossil Hominids. (3) N
Ancient African, Asian, and European human and primate skeletal, dental, and cultural remains. Human biological, behavioral, and cultural evolution. Prerequisite: ASM 101 or approval of instructor.

345 Disease and Human Evolution. (3) F
Interaction of people and pathogens from prehistoric times to the present with emphasis on disease as an agent of genetic selection. Prerequisite: ASM 101 or approval of instructor.

346 Human Origins. (3) S
Humanity's place in nature, fossils, historic and recent concepts of human races, influence of culture on human evolution.

348 Social Issues in Human Genetics. (3) S
Moral and social implications of developments in genetic science, particularly as they affect reproduction, medicine and evolution.

365 Laboratory Methods in Archaeology. (4) N
Techniques of artifact analysis. Basic archaeological research techniques, methods of report writing. Prerequisite: ASM 101 or approval of instructor. May be repeated for credit for total of 8 hours.

435 Archaeological Pollen Analysis. (3) F
Theory, methodology, and practice of pollen analytic techniques. Compares uses in botany, geology, and archaeology. Possible field trips and laboratory. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory.

452 Dental Anthropology. (4) F
Human and primate dental morphology, growth, evolution, and genetics. Within- and between-group variation. Dental pathology and behavioral-cultural-dietary factors. Prerequisite: approval of instructor. Three lectures, 3 hours laboratory.

455 Primate Behavior Laboratory. (3) N
Instruction and practice in methods of observation and analysis of primate behavior. Discussion of the relationship between class work on captive animals and field techniques for studying free-ranging groups. Prerequisites: ASM 343† and approval of instructor. Directed readings and 6 hours laboratory.

465 Quantitative Methods. (3) N
Statistical techniques available as descriptive and analytical tools useful in processing and interpreting anthropological data. Presentation of the concepts underlying parametric statistics; nonparametric methods. Prerequisites: introductory statistics course and ASB 330, or approval of instructor.

466 Computer Archaeology. (3) F
Methods of codifying and ordering nonmetric archaeological data. Structuring of file systems for storage/retrieval and manipulation using computer techniques. Student projects and a thorough review of the literature of computer application for the analysis of archaeological data. Prerequisite: approval of instructor.

471 Conservation: Museum Collections. (3) N
Introduction to the documentation, analysis, cleaning, stabilization and restoration of museum collections; method, theory and practice. Prerequisite: approval of instructor.

472 Archaeological Ceramics. (3) N
Analysis and identification of pottery wares, types and varieties. Systems for ceramic classification and cultural interpretation. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory.

555 Advanced Human Osteology. (3) N
Laboratory and field techniques in dealing with the human skeleton. Emphasis on preparation, identification, radiography, sectioning, microscopy and data processing. Prerequisite: ASM 341† or approval of instructor. One lecture, 6 hours laboratory.

566 Advanced Computer Applications. (3) S
Advanced applications utilize a variety of software packages for managing and manipulation large data sets. Graphic techniques are emphasized as research aids. Prerequisite: ASM 466.

591 Seminar. (3) N
Selected topics in archaeology and physical anthropology.
(a) Physical Anthropology
(b) Primates and Behavior
(c) Advanced Computer Applications in Archaeology
(d) Evolution and Culture (Same as ASB 591)
(e) Interdepartmental Seminar (Same as ASB 591)

ANTHROPOLOGY (ASB)

Courses which may be applied toward the General Studies requirement in Social and Behavioral Sciences.

ASB 102 Introduction to Cultural and Social Anthropology. (3) F,S
Principles of cultural and social anthropology, with illustrative materials from a variety of cultures. The nature of culture. Social, political, and economic systems; religion, esthetics and language.

211 Women in Other Cultures. (3) N
Cross-cultural analysis of the economic, social, political and religious factors that affect women's status in traditional and modern societies.

231 Archaeological Field Methods. (4) S
Excavation of archaeological sites and recording and interpretation of data. Includes local field experience. Prerequisite: ASM 101 or approval of instructor. Two lectures, 8 hours laboratory.

311 Principles of Social Anthropology. (3) S
Comparative analysis of domestic groups and economic and political organizations in primitive and peasant societies.

312 Political Anthropology. (3) F
Comparative examination of the forms and processes of political organization and activity in primitive, peasant, and complex societies.

314 Comparative Religion. (3) F, S
Origins, elements, forms and symbolism of religion; a comparative survey of religious beliefs and ceremonies; the place of religion in the total culture. Prerequisite: ASB 102 or approval of instructor.

315 Primitive Arts and Technology. (3) F
Comparative survey of the material culture of peoples of the world emphasizing production and use of artifacts. Prerequisite: ASB 102 or approval of instructor.

320 Indians of Arizona. (3) F
The traditional cultures and the development and nature of contemporary political, economic and educational conditions among Arizona Indians.

321 Indians of the Southwest. (3) S
Cultures of the contemporary Indians of the Southwestern United States and their historic antecedents. Prerequisite: ASB 102 or approval of instructor.

322 Indians of Mesoamerica. (3) S
Historic tribes and folk cultures. Prerequisite: ASB 102 or approval of instructor.

324 Peoples of the Pacific. (3) N
Peoples and cultures of Oceania focusing particularly on societies of Melanesia, Micronesia and Polynesia. Prerequisite: ASB 102 or approval of instructor.

325 Peoples of Southeast Asia. (3) F
A cultural ecological perspective on the peoples of mainland and insular Southeast Asia. Subsistence modes, social organization, and the impact of modernization. Prerequisite: ASB 102 or approval of instructor.

330 Principles of Archaeology. (3) F
Prehistoric societies. Survey of dating methods, field techniques and artifactual inventories. Geographic, climatic and geological relationships.

331 Old World Prehistory I. (3) F
Development of people as bio-social animals in the Pleistocene, emphasizing technological achievements and focusing upon the relationship between technology and environment. Areas include western Europe, sub-Saharan Africa and western Asia. Prerequisite: ASM 101 or approval of instructor.

332 Old World Prehistory II. (3) S
Transition from hunting and collecting societies to domestication economies; establishment of settled village life, emphasizing the Near East, Egypt, SW Europe. Prerequisite: ASM 101 or approval of instructor.

333 New World Prehistory. (3) S
The variety of archaeological patterns encountered in the Western Hemisphere. Covers the period from the appearance of humans in the New World to European contact; covers the area from Alaska to Tierra del Fuego.

334 Arctic Anthropology. (3) S
Past and present Aleut-Eskimo prehistory, origins, physical features, adaptations, variation and culture with comparisons of Asian Arctic populations. Prerequisite: ASB 101 or approval of instructor.

335 Southwestern Anthropology. (3) N
Past cultures in the Southwest and their relation to present peoples using archaeological, ethnological, and linguistic evidences. Environmental and resource utilization from earliest times to the present.

336 Old World Prehistory III. (3) N
Origins and development of complex societies (advanced chiefdoms, early states); emphasis on Mesopotamia, Egypt with some coverage of Africa, India, China. Prerequisite: ASM 101 or approval of instructor.

337 Prehispanic Civilization of Middle America. (3) S
Pre-conquest cultures and civilizations of Mexico. The Aztecs, Mayas and their predecessors. Prerequisite: ASM 101 or approval of instructor.

338 Archaeology of North America. (3) N
Origin, spread and development of the prehistoric Indians of North America up to the historic tribes. Does not include the Southwest. Prerequisite: ASM 101 or approval of instructor.

351 Psychological Anthropology. (3) S
Approaches to the interrelations between the personality system and the socio-cultural environment. Prerequisite: ASB 102 or approval of instructor.

355 American Indian Views of Man. (3) N
The main historical and geographical groupings of religious material from North America (including Mexico). Myths, ritual, and prose teachings, oral and written.

364 Museum Techniques. (3) F
Laboratory techniques in restoration of artifacts. Museum display practices to present anthropological material. Prerequisite: ASM 101 or approval of instructor.

383 Linguistic Theory: Phonology. (4) F
Contemporary theories of the sound system of language. Laboratory. Prerequisite: ASB 381 or FLA 400 or approval of instructor.

411 Kinship and Social Organization. (3) S
Meanings and uses of concepts referring to kinship, consanguinity, affinity, descent, alliance and residence in the context of a survey of the varieties of social groups, marriage, rules and kinship terminological systems. Prerequisite: 6 hours of anthropology or approval of instructor.

412 History of Anthropology. (3) F
Historical treatment of the development of the culture concept and its expression in the chief theoretical trends in anthropology between 1860 and 1950. Prerequisite: ASB 102 or approval of instructor.

415 Primitive Art. (3) S
Art forms of primitive people in relationship to their cultural setting. Prerequisite: ASB 102 or approval of instructor.

416 Economic Anthropology. (3) F
Economic behavior and the economy in pre-industrial societies; description and classification of exchange systems; relations between production, exchange systems and other societal sub-systems. Prerequisite: ASB 102 or approval of instructor.

421 The North American Indian. (3) F, S
Archaeology, ethnology and linguistic relationship of the Indians of North America. Does not include Middle America. Prerequisite: ASB 102 or approval of instructor.

426 Historical Archaeology. (3) NR
Principles, techniques, and important sites. Use of ethnohistory, laboratory techniques, and artifact analysis. Discussion of value to historical understanding. Prerequisite: one course in archaeology or approval of instructor.

430 Underwater Archaeology. (3) S
Survey of methods and techniques. Effects of changing sea levels on location and movement of human groups. Prerequisite: one course in archaeology or approval of instructor.

431 Ritual: The Creative Process. (3) N
Ritual as an essential and creative religious act. Fundamental structures and typologies of ritual; techniques for interpretation and understanding ritual. Prerequisite: ASB 314†.

479 The Anthropology of Peasant Peoples. (3) N
Description, comparison and theories pertaining to the social and community structure and world views of peasant peoples. Prerequisite: ASB 102.

480 Introduction to Linguistics. (3) F
Descriptive and historical linguistics. Survey of theories of human language, emphasizing synchronic linguistics.

481 Language and Culture. (3) S
Application of linguistic theories and findings to non-linguistic aspects of culture; language change; psycholinguistics. Prerequisite: ASB 102 or approval of instructor.

483 Sociolinguistics and the Ethnography of Communication. (3) N
Relationships between linguistic and social categories; functional analysis of language use, maintenance and diversity; interaction between verbal and nonverbal communication. Prerequisite: ASB 381 or approval of instructor.

532 Graduate Field Anthropology. (2-8) S
Independent research on a specific anthropological problem to be selected by the student in consultation with the staff. Prerequisites: ASM 338† or equivalent, and approval of instructor. May be repeated for credit.

533 Cultural Inventory Methods. (3) N
Problems and procedures in locating and recording archaeological sites. Analysis of site types, situations, and relation to natural resources. Interpretation from surface remains. Field work. Prerequisite: approval of instructor.

535 Public Archaeology. (4) N
Theoretical and practical applications of cultural resources legislation and policy. Legal and administrative requirements; conservation, development, and management of cultural resources; CRM research design formulation. Prerequisites: regular graduate student status, 12 completed graduate hours in archaeology, approval of instructor. Seminar and field work.

542, 543 Method and Theory of Archaeology. (3, 3) F, S
Development and theoretical basis of archaeology. Rationale and methods of reconstruction of past human behavior from archaeological data. Prerequisite: approval of instructor.

544 Settlement Patterns. (3) N
Spatial arrangement of residences, distribution and density over the landscape, and utilization of a given environment for habitation. Prerequisite: approval of instructor.

546 Pleistocene Prehistory. (3) F
Development of society and culture in the Old World during the Pleistocene epoch, emphasizing technological change through time and the relationship of people to their environment. Prerequisite: ASB 331† or equivalent.

547 Rise of Urban Life. (3) S
Focus on the archaeological evidence in the Old World for the transition from subsistence economies dependent upon hunting and gathering to those dependent upon domesticated plants and/or animals. Impact of this shift in subsistence on local groups and on sedentism in both "nuclear" and "nonnuclear" areas. Prerequisite: ASB 332† or equivalent.

582 Linguistic Theory: Syntax. (3) N
Contemporary theories of the grammatical structure of languages. Prerequisite: ASB 381 or FLA 400 or approval of instructor.

583 Linguistic Theory: Phonological Systems. (3) F
Origins and development of contemporary phonological systems with particular attention to non-Western languages. Prerequisite: FLA 400 or ASB 381 or approval of instructor.

591 Seminar. (3) N
Selected topics in archaeology, linguistics and social-cultural anthropology.

(a) Cultural Anthropology
(b) Social Anthropology
(c) Problems in Southwestern Ethnology
(d) Culture and Personality
(e) Linguistics
(f) Museology
(g) Problems in Southwestern Archaeology
(h) Archaeology
(i) Evolution and Culture (Same as ASM 591)
(j) Interdepartmental Seminar (Same as ASM 591)

Special Courses: ASM and ASB 294, 394, 484, 492, 493, 494, 498, 499, 500, 580, 584, 590, 592, 594, 598, 599, 790, 792, and 799. (See pages 35-36.)

Biological Sciences

The following curricula are offered jointly by the Department of Botany and Microbiology and the Department of Zoology. Students who elect one of these programs are advised by a member of the Botany and Microbiology Department or by a member of the Zoology Department.

Bachelor of Science Degree Curriculum

Biology—A combined offering by the faculties of the Departments of Botany-Microbiology and Zoology. This major serves students desiring a broader program in the biological sciences than that provided by the more specialized majors in the degree programs of the individual departments. The major consists of 63 hours, including 43 hours in biological sciences and 20 hours in supplementary areas, plus a mathematics proficiency. Required major courses (31 hours) are BIO 181, 182, 320, 340; BOT 300; MIC 201 or 210; MIC 202; ZOL 350; BOT 360 or ZOL 360; the remaining 13 hours are to be selected so that the total major hours reflects a balance between the two departments. Required supplementary courses are CHM 113, 115; CHM 231 (or CHM 331, 332, 335, 336); PHY 101 (or PHY 111, 112, 113, 114); CSC 181 or 183. Mathematics proficiency requirement: MAT 115 (or MAT 117, 118) and 210 (or any calculus). One year of a foreign language, or equivalent competence (see Degree Requirements, page 53).

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Biological Sciences—A combined offering by the faculties of Departments of Botany-Microbiology and Zoology. The major consists of a minimum of 42 hours of credit, plus at least 9 hours in supporting courses. Required major courses are BIO 181, 182, 320, 340; BOT 300 or 370; BOT 360; MIC 201 or 210; MIC 202; ZOL 350, 360. The remaining courses in the major (7 hours minimum) must include one from each of the two departments. Required supporting courses are: CHM 113, 115. BIO 480 is required in the professional education program.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Biological Sciences—Consists of 24 semester hours as follows: BIO 181, 182, 340; MIC 201 or 210; MIC 202; and 8 additional hours in courses listed under Biology, Botany, Microbiology, and Zoology, with the *exception* of the following: BIO 100, 218, 318; BOT 100; ZOL 110, 300. Supporting course: BIO 480 is required in addition to the 24 hours credit in biological sciences.

Botany and Microbiology

PROFESSORS:
SOMMERFELD (LS C-206) ARONSON, JOHNSON, NASH, PATTEN, PINKAVA, REEVES, SCHMIDT, TRELEASE

ASSOCIATE PROFESSORS:
BIRGE, BURKE, CLARK, LEATHERS, SZAREK, TOWILL

ASSISTANT PROFESSORS:
KLOPATEK, SWAFFORD

PROFESSORS EMERITUS:
CANRIGHT, NORTHEY

VISITING PROFESSOR:
STARR

FACULTY ASSOCIATES:
DICKSON, DOWNS, MASS, ROBERTS

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Botany—Consists of a minimum of 45 semester hours of credit in botany and approved related fields, of which 18 must be in upper division courses. Required courses are BIO 181, 182, 320, 340; MIC 201† or 210†, 202; BOT 350, 360†, 370 and at least one of the following: BOT 410, 434, or 450; and laboratory or field experience in the form of BIO 310 or BOT 499, (3 semester hours). Required supplementary courses CHM 113, 115 and 231†, or the sequence 331, 332, 335 and 336; MAT 115† or 141†; and one year of an approved foreign language. (See Foreign Language Requirements, page 53.)

Microbiology—A student majoring in microbiology is required to take the following courses: BIO 181, 182, 340; CHM 331, 332, 335, 336; MIC 202†, 210†, 302; plus 16 hours of upper division electives in microbiology or approved related fields. Total: 42 semester hours. In addition, the student is required to have proficiency equivalent to one year of college French, German or Russian. The required supplemental courses are: CHM 113†, 115; MAT 115† or 141†; PHY 111†, 112, 113, 114. (See Foreign Language Requirement, page 53.)

Clinical Laboratory Sciences—The goal of the Clinical Laboratory Sciences program is to prepare individuals to practice in the field of clinical laboratory sciences, which includes the major disciplines of Clinical Chemistry, Hematology, Immunohematology and Microbiology. Employment opportunities exist in hospital, private, physician and research laboratories; government; sales; management; and education. After obtaining a B.S. in Clinical Laboratory Sciences, the graduate is eligible for national certification by examination.

A student majoring in Clinical Laboratory Sciences is required to pass the following courses with a 2.5 minimum GPA prior to acceptance in the accredited Professional Study Program: CHM 113, 115, 225, 226, 231, 361; MAT 117; PHY 101; BIO 181, 182; MIC 201, 202, 420; ZOL 241, 360; CLS 100, 300. (Equivalent courses may be substituted upon approval of advisor.) Completion of the degree is dependent upon acceptance of the student into the accredited Professional Study Program which consists of 44 hours of Clinical Laboratory Sciences courses. The University does not guarantee that all students will be accepted into the Professional Study Program due to space limitations at the clinical affiliates and restrictions of program accreditation. To obtain further information regarding acceptance procedures and program standards, contact the Department for a program brochure. For proper course planning, students must meet with a Clinical Laboratory Sciences advisor.

Departmental Graduate Programs

The Department of Botany and Microbiology offers programs leading to the degrees of Master of Natural Science, Master of Science and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

BIOLOGY

BIO 100 The Living World. (4) F, S, SS
Principles of biology. Not offered for credit to students who have had advanced biology in high school. Cannot be used for major credit in the biological sciences. Three lectures, 3 hours laboratory.

181, 182 Biological Principles and Processes. (4) F, S; SS (181)
A comprehensive treatment of biological concepts emphasizing fundamental principles of biology and the inter-

play of structure and function at the molecular, cellular, organismal, and population levels of organization. For majors in biological sciences and preprofessional students in health related sciences. Secondary school chemistry strongly recommended. (BIO 181 is a prerequisite for BIO 182). Three lectures, 3 hours laboratory.

217 Introduction to Fisheries and Wildlife Management. (3) F
Principles relating to management of cold and warm water fisheries and terrestrial wildlife, emphasizing management of ecosystems. Designed for prospective wildlife biologists. Prerequisites: 8 semester hours of biological sciences.

218 History of Medicine. (1) F
Development of medical concepts.

300 Natural History of Arizona. (3) F
Plant and animal communities of Arizona. Cannot be used for major credit in the biological sciences. Prerequisite: junior standing.

301 Field Natural History. (1) F, S
Organisms and their natural environment. Two weekend field trips and a field project. Prerequisite: BIO 300 or concurrent enrollment. Cannot be used for major credit in the biological sciences.

310 Special Problems and Techniques. (1-3) F, S
Qualified undergraduates may investigate a specific biological problem under the direction of a faculty member. Prerequisites: formal conference with the faculty member and approval of the problem by the faculty member and of the departmental chair. May be repeated for a total of 6 credits.

318 History of Biology. (2) NR
Development of biological concepts. Prerequisite: 12 semester hours of biological sciences.

320 Fundamentals of Ecology. (3) F, S
Basic concepts in ecology. Organization, functioning and development of ecological systems, energy flow, biogeochemical cycling, environmental relations, population dynamics. Prerequisites: BIO 182 or equivalent or approval of instructor.

330 Ecology and Conservation. (3) F
Ecological and biological concepts of conservation used to understand man-made ecological problems. Cannot be used for major credit in the biological sciences.

332 Cell Biology. (3) F
Survey of major topics in cell biology, including structural, biochemical, and molecular aspects of cell function. Prerequisite: BIO 182.

340 General Genetics. (4) F, S, SS
Science of heredity and variation. Prerequisite: BIO 182. Three hours lecture, 1 hour recitation.

415 Biometry. (4) F
Statistical methods applied to biological problems, including design of experiments, estimation, tests of significance, analysis of variance, regression, correlation, chi square and bioassay; the use of computers. This course will not satisfy laboratory requirements for the Liberal Arts General Studies program. Prerequisite: MAT 210 or equivalent. Three hours lecture, 3 hours laboratory.

424 Analysis of Ecosystems. (3) F '86
Ecosystems, emphasizing production, respiration and decomposition. Prerequisite: BIO 320†.

426 Limnology. (4) S
Structure and function of aquatic ecosystems with emphasis on freshwater lakes and streams. Three lectures, 3 hours laboratory or field trip. Prerequisites: BIO 320† or approval of instructor.

428 Biogeography. (3) F
Environmental and historical processes determining distributional patterns of animals and plants, emphasizing terrestrial life. Prerequisite: BIO 182 or equivalent; junior standing.

429 Advanced Limnology. (3) S
Recent literature, developments, methods and limnological theory; field and laboratory application to some particular topic in limnology. Prerequisite: BIO 426†.

430 Advanced Developmental Biology. (3) S
Current concepts and experimental methods involving differentiation and biosynthetic activities of cells and organisms, with examples from micro-organisms, plants, and animals. Prerequisite: ZOL 330†.

432 Biochemical Cytology. (3) S
Celluar functions and chemistry based on the macromolecular organization of cellular components emphasizing the use of analytical procedures such as cell fractionation, ultrastructural radioautography, and cytochemistry. Prerequisites: BOT 360† or ZOL 360† or equivalent; CHM 231† or 331† or equivalent.

441 Cytogenetics. (3) F
Chromosomal basis of inheritance. Prerequisite: BIO 340†.

442 Cytogenetics Laboratory. (2) F
Microscopic analysis of meiosis, mitosis and aberrant cell division. Prerequisite: BIO 441† or concurrent enrollment. Six hours laboratory.

443 Molecular Genetics. (3) F
Nature and function of the gene. Prerequisites: BIO 340† and a course in organic chemistry.

445 Organic Evolution. (3) F
Processes and adaptive change and speciation in sexual populations. Prerequisite: BIO 340† or ZOL 241†.

464 Photobiology. (3) S
Principles underlying the effects of light on growth, development, and behavior of plants, animals, and microorganisms. Prerequisites: 12 hours of courses in life sciences; CHM 231† or 331†.

480 Methods of Teaching Biology. (3) F, S
Methods of instruction, experimentation, organization and presentation of appropriate content in biology. Prerequisites: either SED 311† or concurrent enrollment in SED 311 and 20 hours in the biological sciences. Two lectures, 3 hours laboratory.

512 Transmission Electron Microscopy. (4) F, S
Theory, use, and methods of preparing biological materials for transmission electron microscopy. Prerequisites: approval of instructor. Materials fee. Two lectures, 6 hours laboratory.

515 Scanning Electron Microscopy. (2) SS
Theory and use of scanning electron microscope for biological materials. Intensive five-week mini course. Prerequisite: approval of instructor. Materials fee. Three hours lecture, 6 hours laboratory.

520 Biology of the Desert. (2) N
Factors affecting plant and animal life in the desert regions and adaptations of the organisms to these factors. Prerequisite: 10 hours of biological sciences and/or approval of instructor.

526 Quantitative Ecology. (3) N
Sampling strategies, spatial pattern analysis, species diversity, classification and applications of multivariate techniques to ecology. Prerequisites: one course in ecology; BIO 415† or equivalent. Two lectures, 3 hours laboratory.

Special Courses: BIO 394, 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 598, 599. (See pages 35-36.)

BOTANY

BOT 100 Plants and Human Affairs. (4) F, S, SS
The study of plants in relation to human affairs. Emphasis on edible, medicinal and commercially significant plants, how they live and grow and how mankind has applied knowledge to manipulate them. Not for majors in the biological sciences. Three lectures, 3 hours laboratory.

300 Survey of the Plant Kingdom. (4) F
Systematic and evolutionary survey of the plant kingdom emphasizing diversity of gross and cellular structure, reproduction, life cycles and habitat. Prerequisite: one of the following: BIO 100, 182, BOT 100, ZOL 110, or equivalent. Three hours lecture, 3 hours laboratory.

301 Economic Botany. (3) F
Plants and plant products used by man throughout the world including their cultivation, processing and uses in modern life. Fibers, medicinals, beverages, perfumes, foods. Prerequisite: BIO 100 or equivalent.

350 Plant Anatomy. (4) F
Development and mature structure of tissues of vascular plants; patterns and modifications of leaf, stem, root and flower. Prerequisite: BIO 182 or equivalent. Three lectures, 3 hours laboratory.

360 Plant Physiology. (4) F, S, SS
Plant growth and development, nutrition, water relations, reproduction, metabolism and photosynthesis. Prerequisites: BIO 182 or equivalent; CHM 231†. Three lectures, 3 hours laboratory.

370 The Flora of Arizona. (4) S
Principles of taxonomy, identification of Arizona plants. Prerequisites: BIO 182, or equivalent, or approval of the instructor. Two lectures, 6 hours laboratory.

410 Lichenology. (3) F '85
Chemistry, ecology, physiology and taxonomy of lichens. Prerequisite: BIO 182 or equivalent. Two lectures, 3 hours laboratory.

420 Plant Ecology. (4) S
Plants in relation to environments. Prerequisite: BIO 320† or equivalent. Three lectures, 3 hours laboratory or field trip. One weekend field trip.

425 Plant Geography. (3) F '86
Plant communities of the world and their interpretation, emphasizing North American plant associations. Prerequisite: BIO 182 or equivalent or approval of instructor.

434 General Mycology. (3) F
Various groups of fungi, their morphology, identification procedures and economic significance. Prerequisites: BIO 182 or equivalent, and/or MIC 202†. Two lectures, 3 hours laboratory.

445 Morphology of the Vascular Plants. (4) F '85
Comparative form and evolutionary trends in the major groups of vascular plants. Prerequisites: BOT 300† or equivalent. Three lectures, 3 hours laboratory.

448 Palynology. (2) N
Importance of spores and pollen (both fossil and modern) to systematics, evolution, ecology and stratigraphy. Prerequisite: approval of instructor.

450 Phycology. (4) S
The algae, both fresh water and marine forms, emphasizing field collection and identification of local representatives. Morphological, ecological, and economic aspects of the algae. Prerequisite: BIO 182 or approval of instructor. Three lectures, 3 hours laboratory.

461 Physiology of Lower Plants. (3) F '86
Cellular physiology and biochemistry of algae and fungi; responses of these organisms to chemical and physical stimuli and their process or morphogenesis. Prerequisites: BIO 182 or equivalent; CHM 231†.

470 Taxonomy of Southwestern Vascular Plants. (4) SS
Identification of the vascular plants of the Southwest and the principles underlying their classification. Not open to students who have had BOT 370†. Three lectures, 6 hours laboratory. Two field trips. Summer only.

475 Angiosperm Taxonomy. (3) S '87
Principles underlying angiosperm phylogeny. Prerequisite: BOT 370† or approval of instructor. Two lectures, 3 hours laboratory.

480 Plants: Pleasures and Poisons. (3) S
Poisonous, medicinal, and other drug plants. Plant products and their effects on man; historical and modern perspectives. Prerequisites: BIO 100, 182, BOT 100 or equivalent, CHM 231† or equivalent.

490 Paleobotany. (4) S '86
A broad survey of plant life of the past, including the structure of plant fossils, their geologic ranges, geographic distribution and paleoenvironment. Prerequisite: BIO 182 or equivalent. Three lectures, 3 hours laboratory or field trip.

510 Experimental Design. (3) S '87
ANOVAS, one-way classification of factorial and partially hierarchic designs, introductory multivariate statistics. Prerequisite: BIO 415† or equivalent. One 3-hour lecture at night.

520 Biophysical Ecology. (3) F '86
Theory of physical microenvironments and effects on plant growth. Consideration of plant energy exchange and soil-plant-atmosphere water relations. Prerequisite: BOT 360† or approval of instructor.

525 Ecophysiology. (3) F '85
Physiological adaptation to environmental stresses and its ecological significance for plant survival. Environmental and biological control of photosynthesis and transpiration. Prerequisite: BOT 360† or approval of instructor.

564 Plant Metabolism. (3) F '85
General plant metabolism and typical plant products, emphasizing biosynthesis and functions of storage products, cell wall constituents, plant acids, pigments, hormones and numerous secondary products. Prerequisites: CHM 231†; BOT 360†; or approval of instructor.

570 Plant Secondary Chemistry. (3) S '86
Biosynthesis and distribution of plant natural products within various plant taxa. Prerequisites: CHM 331†, 332† or equivalent. Three lectures.

571 Methods in Biochemical Systematics. (3) S '87
Techniques in isolation and characterization of major classes of natural products used in biochemical systematics. Prerequisite: approval of instructor. Two lectures, 3 hours laboratory.

576 Experimental Plant Systematics. (3) S '86
Interpretation of taxa, utilizing cytological, genetic, ecological, morphological and anatomical techniques and data. Prerequisite: BOT 370 or 470 or approval of instructor. Two lectures, 3 hours laboratory.

591 Seminar. (1) F, S
Topics may be selected from the following:

(a) Biosystematics
(b) Desert Ecology
(c) Nonvascular Plants/ Protists
(d) Plant Physiology

Special Courses: BOT 484, 492, 493, 494, 497, 498, 499, 500, 590, 592, 598, 599, 700, 790, 791, 792, 799. (See pages 35-36.)

MICROBIOLOGY

MIC 201 Microbiology. (3) F, S, SS
Basic course for nonmajors emphasizing general principles of the role of micro-organisms in health, ecology, and related applied fields. Prerequisites: CHM 101 and any one of the following: BOT 100, BIO 100, or approval of instructor.

202 Microbiology Laboratory. (1) F, S, SS
Principles and laboratory techniques used in identifying and handling micro-organisms. Prerequisite: credit or concurrent enrollment in MIC 201† or 210†. Three hours laboratory.

210 General Bacteriology. (3) F, S
Detailed study of the bacterial cell, its structure, genetics, physiology, and taxonomy. Intended for microbiology majors and others with similar preparation. *Not open to students with credit in MIC 201.* Prerequisites: BIO 182; and CHM 115†.

302 Advanced Bacteriology Laboratory. (2) F
Advanced laboratory techniques in bacterial growth, physiology, genetics, microscopy, and basic virology. Required of microbiology majors. Prerequisites: either group A or B: (A) MIC 202† and 210†; (B) MIC 201† and 202† and approval of instructor. Four hours laboratory.

360 Bacterial Physiology. (3) F
Mechanisms and control of cell metabolism, structures, and functions. Prerequisites: MIC 210; credit or concurrent enrollment in CHM 331, or approval of instructor.

380 Plant Pathology. (3) F, SS
Biotic and abiotic agents of disease, including field observations and methods of control. *Prerequisite:* BOT 360 or approval of instructor.

420 Immunology. (4) F, S, SS
Principles of immunity and their application to diagnosis, systematics and allergies. Prerequisites: MIC 202†; CHM 231† or equivalent. Two lectures, 6 hours laboratory.

425 Advanced Immunobiology. (3) S
Cells and tissues of immune system, their structure, function, and interaction. Prerequisites: MIC 420†. Two lectures, 3 hours laboratory.

434 Medical Mycology. (3) S
Fungi as causal agents of diseases of man, including pathology and epidemiology, emphasizing techniques of diagnosis. *Prerequisite: MIC 202† or equivalent.* Two lectures, 3 hours laboratory.

441 Bacterial Genetics. (3) S
Survey of genetic exchange and regulatory processes in bacteria and their viruses. Bacteria and viruses as tools in genetic engineering. Prerequisites: MIC 201† or 210† and BIO 340†, or approval of instructor.

442 Bacterial Genetics Laboratory. (1) S
Techniques of mutagenesis, mapping, and strain construction. Prerequisites: MIC 202† and credit or concurrent enrollment in MIC 441†. Four hours laboratory.

470 Systematic Bacteriology. (3) S
Classification and identification of bacteria. Prerequisites: MIC 202†, 5 hours of microbiology. One lecture, 6 hours laboratory.

481 Diagnostic Bacteriology. (3) F
Biochemical and immunological methods for characterizing pathogenic bacteria. Prerequisites: MIC 202†, CHM 231† or CHM 331†. Two lectures, 3 hours laboratory.

485 Virology. (3) F
Fundamental nature of viruses and other obligate intracellular parasites, their replication, pathogenesis, ecology and cultivation. Prerequisites: 8 hours of microbiology; CHM 331†. Two lectures, 3 hours laboratory.

530 Bacterial Differentiation. (3) F
Molecular biology of sporulation and germination in bacteria. Emphasis on the control of cellular differentiation. Prerequisites: MIC 441 or BIO 443, or approval of instructor.

545 Recombinant DNA Methodology. (2) F
Principles of genetic engineering using *in vitro* DNA recombination; characteristics of plasmid and phage vectors; recombinant selection and physical characterization. Prerequisites: MIC 441 and BIO 443, approval of instructor.

546 Recombinant DNA Laboratory. (2) F
Basic techniques in isolation of chromosomal, plasmid, and bacteriophage DNA; transformation; and gene-splicing methods. Prerequisites: Concurrent enrollment in MIC 545.

560 Microbial Enzymology. (3) S
Discussion of techniques and methods for the assay, isolation and characterization of microbial enzymes and the utilization of these methods in the laboratory. Prerequisites: 5 hours of microbiology, CHM 331 or equivalent, approval of instructor. Two lectures, 3 hours laboratory.

581 Selected Topics in Host-Bacterial Relationships. (3) S
Pathogenic mechanisms and host responses in bacterial diseases. Prerequisites: MIC 481† or approval of the instructor; MIC 420†.

591 Seminar. (1-3) N
Topics may be selected from the following:

(a) Molecular Biology	(e) Genetic Engineering
(b) Virology	(f) Immunology
(c) Enzymology	(g) Bacterial Ecology
(d) Genetics	(h) Pathogenic Bacteriology

Special Courses: MIC 298, 484, 492, 493, 494, 497, 498, 499, 500, 590, 592, 598, 599, 700, 790, 791, 792, 799. (See pages 35-36.)

CLINICAL LABORATORY SCIENCES

CLS 100 Introduction to Clinical Laboratory Sciences. (1) F, S
Introduction to the field of clinical laboratory technology. Required for Clinical Laboratory Sciences majors.

300 Clinical Laboratory Instrumentation. (4) F, S
Principles, structure, and application of clinical laboratory instruments, including electronics, spectrophotometric analysis, quality control, laboratory mathematics and automated analysis. Prerequisite: CHM 115† and PHY 101 or equivalents. Three lectures, 3 hours laboratory.

310 Principles of Clinical Chemistry I. (6) S
Theory and application of principles of clinical chemistry, with emphasis on laboratory techniques, pathophysiology, methods of analysis, assessment of procedure. Three lectures, 9 hours laboratory.

320 Principles of Clinical Microbiology I. (6) S
Emphasizes disease mechanisms, isolation, identification of medically significant fungi and bacteria. Includes principles of laboratory safety and quality control. Three lectures, 9 hours laboratory.

330 Principles of Clinical Hematology I/Body Fluids. (3) F
Theory and application of principles in hematology with emphasis on techniques to evaluate blood dyscrasias and analyze body fluids. Two lectures, 3 hours laboratory.

410 Principles of Clinical Chemistry II. (2) SS
Continuation of Clinical Chemistry I with emphasis on principles of automation, laboratory computers, and method evaluation. One lecture, 3 hours laboratory.

411 Advanced Applications of Clinical Chemistry. (4) F
Clinical application of theory/techniques from Principles of Clinical Chemistry. Emphasis on operation of common laboratory instrumentation, clinical correlation, and radioimmunoassay. Minimum 180 hours practicum.

420 Principles of Microbiology II. (2) SS
Disease mechanisms, identification of medically significant parasites. Mycobacteria, Actinomycetes, Chlamydia, Rickettsia, Mycoplasma, viruses. One lecture, 3 hours laboratory.

421 Advanced Applications of Clinical Microbiology. (4) S
Practical laboratory application of the principles of specimen collection, processing, detection, identification, and antimicrobial testing of medically significant bacteria, fungi, and parasites. Minimum 180 hours practicum.

430 Principles of Clinical Hematology II/Hemostasis. (3) F
Theory and applications of principles in hematology with emphasis on etiology, pathophysiology, clinical manifestations and treatment of blood dyscrasias/hemostatic defects. Two lectures, 3 hours laboratory.

431 Advanced Applications of Clinical Hematology. (4) S
Practical laboratory application of methods/techniques used to evaluate and diagnose blood dyscrasias/hemostatic defects. Applied techniques in Body Fluid Analysis. Minimum 180 hours practicum.

440 Principles of Clinical Immunology/Immunohematology. (4) F
Theoretical and practical application of clinical immunology and immunohematology. Emphasizes serological techniques which aid disease diagnosis, and blood donor selection. Three lectures, 3 hours laboratory.

441 Advanced Applications of Clinical Immunology/Immunohematology. (3) S
Practical laboratory application of the principles of serological methods used in diagnosing disease and selecting blood components for transfusion therapy. Minimum 135 hours practicum.

450 Principles of Clinical Laboratory Administration. (2) S
Principles of management with emphasis on the clinical laboratory. Basic management process, personnel supervision, identification and allocation of resources.

460 Principles of Clinical Laboratory Education. (1) S
Principles of learning, with application to the development of instructional objectives, strategies and evaluation for teaching-learning situations in the laboratory.

Chemistry

PROFESSORS:
MUNK (PS D-102), BIEBER, BIRK, T. BROWN, BUSECK, CRONIN, EYRING, FUCHS, GLAUNSINGER, HARRIS, HOLLOWAY, JUVET, LIN, LIU, C. MOORE, NAVROTSKY, O'KEEFFE, PETTIT, VON DREELE, WAGNER, WHITEHURST, WILLIAMS, YUEN, ZASLOW

ASSOCIATE PROFESSORS:
GUST, LOHR, T. MOORE, PETUSKEY, ROSE

ASSISTANT PROFESSORS:
BALASUBRAMANIAN, McMILLAN, SKIBO

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Chemistry—Consists of 45 semester hours of credit, of which 30 must be in chemistry and 15 in closely related fields. Required courses are: CHM 117†, 118, (or 113†, 115); 225, 226, 317, 318, 319, 320 (or 331, 332, 335, 336); and 341†, 343, 453. Related courses must include PHY 111†, 112, 113, 114; and MAT 115†, 210, or equivalent or more advanced courses. The remaining courses to complete the major will be determined by the student in consultation with his/her advisor. (See Foreign Language Requirement, page 53.)

Bachelor of Science Degree Curriculum

Chemistry—Consists of 42 semester hours of credit in chemistry. Required courses are: CHM 117†, 118, 317, 318, 319, 320, 425, 426, 427, 428, 441, 442, 444 and 453. In addition, PHY 115†, 116, 117, 118; MAT 274†, 290†, 291 (or 270†, 271, 272); and one year of German (or Russian or French) is required. German is essential for students planning advanced study in certain fields, especially organic chemistry. An appropriate course in computer science is recommended. The remaining chemistry courses to complete the major will be determined by the student in consultation with his/her advisor. With the consent of the department chair, selected advanced courses from other related scientific disciplines may be accepted in lieu of elective chemistry courses to complete the major.

Transfer students will be interviewed and advised of possible preparatory work. They must contact the department to arrange for the interview in advance of registration. (See Degree Requirements, page 53.)

American Chemical Society Certification. A student who satisfactorily completes the Bachelor of Science degree program will be certified by the Department of Chemistry to the American Chemical Society as having met the specific requirements for undergraduate professional training in chemistry.

Chemistry Exchange Program. Selected students in either the B.A. or B.S. program have the opportunity to participate in a chemistry exchange program during their junior year with the Fédération Universitaire et Polytechnique de Lille in France. In order to qualify for this program, the student must have a working knowledge of French, and for this purpose, two years of French or the equivalent is recommended.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Chemistry—Option 1. Consists of 42 semester hours of credit in chemistry and related fields. Required courses are: CHM 113†, 115, 225, 226; 331, 332, 335, 336 (or 231, 361); 341 (or 441, 442); 480 (or PSE 480† or PHY 480†); PHY 111†, 112, 113, 114; and MAT 115†, 210. The remaining courses to complete the major will be determined by the student in consultation with his/her advisor.

Chemistry—Option 2. Consists of 30 semester hours of chemistry, which includes all of the required chemistry courses listed in Option 1, and selection of the corresponding option in either mathematics or physics; that is, completion of an additional 30 semester hours in the chosen area as specified by the department selected.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Chemistry—Consists of 24 semester hours of credit in chemistry. Required courses are: CHM 113†, 115; 225, 226; 231, 361 (or 331, 332, 335, 336); and 341†. The remaining courses to complete the minor will be determined by the student in consultation with his/her advisor.

Departmental Graduate Programs

The Department of Chemistry offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

CHEMISTRY

CHM 101* Introductory Chemistry. (4) F, S
Elements of general chemistry. Adapted to the needs of students in nursing, home economics, agriculture and physical education. Recommended for General Studies credit. Normally followed by CHM 231. Three lectures, 1 quiz, 2 hours laboratory.

113* General Chemistry. (4) F, S, SS
Principles of chemistry. Adapted to the needs of students in the physical, biological and earth sciences. Prerequisite: Three semesters of high school algebra or MAT 106. One year of high school chemistry recommended. Three lectures, 1 quiz, 2 hours laboratory.

114* General Chemistry for Engineers. (4) F, S
One semester college chemistry with emphasis towards engineering. Prerequisites: Three semesters of high school algebra or MAT 106; one year of high school chemistry. Students without high school chemistry or chemical engineering majors must enroll in the CHM 113†, 116† sequence instead of CHM 114. Three lectures, 1 quiz, 2 hours laboratory.

115* General Chemistry With Qualitative Analysis. (5) F, S, SS
Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals and metalloids, introduction to organic chemistry. Laboratory includes qualitative analysis. Prerequisite: CHM 113† or two years of high school chemistry. Three lectures, 2 quizzes, 4 hours laboratory.

116* General Chemistry. (4) F, S
Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals and metalloids, introduction to organic chemistry. Prerequisite: CHM 113† or two years of high school chemistry. Three lectures, 1 quiz, 2 hours laboratory.

117*, 118* General Chemistry for Majors. (4, 5) F, S
Unified approach to chemical bonding, molecular structure, descriptive chemistry of the elements, properties of matter in various physical states, basic thermodynamics, chemical stoichiometry and chemical analysis. Prerequisites: Minimum of one year each of high school chemistry and physics, three years of high school mathematics, CHM 117 for CHM 118. Corequisite: MAT 290† (or 270†) for CHM 118†. CHM 117: Three lectures, 1 conference, 2 hours laboratory. CHM 118: Three lectures, 1 conference, 5 hours laboratory.

225* Analytical Chemistry. (3) F, S, SS
Principles and methods of chemical analysis. Primarily for students in agriculture, pre-medicine, pre-dentistry, and medical technology. Prerequisite: CHM 115† or 116†.

226* Analytical Chemistry Laboratory. (2) F, S, SS
Experiments in chemical analysis. Corequisite: CHM 225†. One conference, 5 hours laboratory.

231* Elementary Organic Chemistry. (4) F, S
Representative groups of organic compounds, emphasizing biological applications. Adapted to students in nursing, home economics, agriculture and physical education. Prerequisite: CHM 101 or 114†, or 115†, or 116†, or one year of high school chemistry with grades of A or B, or approval of instructor. Three lectures, 1 quiz, 2 hours laboratory.

301 Chemistry and Society. (3) S, F
A qualitative survey of chemistry and its impact on modern technology and the environment. May not be counted toward the chemistry major.

317*, 318* Organic Chemistry for Majors. (3, 3) F, S
Structures, reaction mechanisms and kinetics, and systematic syntheses of organic compounds. Prerequisite: CHM 118†. Corequisites: CHM 319† for CHM 317†, CHM 320† for CHM 318†.

319* Organic Chemistry Laboratory I for Majors. (1) F
Emphasis on mechanisms, kinetics, and products of organic reactions. Pre- or corequisite: CHM 317†. One conference, 3 hours laboratory.

320* Organic Chemistry Laboratory II for Majors. (2) S
Continuation of CHM 319. Pre- or corequisite: CHM 318†. One conference, 7 hours laboratory.

331*, 332* General Organic Chemistry. (3, 3) F, S, SS
Chemistry of organic compounds. Prerequisite: CHM 115† or 116† or 118†; CHM 331 for 332.

335*, 336* General Organic Chemistry Laboratory. (1, 1) F, S, SS
Organic chemical experiments in separation techniques, synthesis, analysis and identification, and relative reactivity. Corequisites: CHM 331† for CHM 335†, CHM 332† for CHM 336†. Prerequisite: CHM 335† for CHM 336†. Four hours laboratory.

341* Elementary Physical Chemistry. (3) F
Properties of solids, liquids, gases, solutions, equilibrium, colloidal state. For pre-medical, biology, agriculture, etc., students. Prerequisites: CHM 114† or 118† or 225†, and CHM 231† or 331†, and MAT 210†.

343* Physical Chemistry Laboratory. (1) F
Physical chemical experiments. Corequisite: CHM 341† or 441†. Three hours laboratory.

361* Principles of Biochemistry. (3) F, S, SS
Structures, properties, and functions of proteins, enzymes, nucleic acids, carbohydrates, and lipids; the utilization and synthesis of these materials by living systems, and the relationship of these processes to energy production and utilization. Prerequisite: CHM 231†, 318† or 332†.

367 Elementary Biochemistry Laboratory. (1) F, S, SS
Experiments include qualitative analysis of major biological constituents such as carbohydrates, lipids, nucleic acids and proteins, and measurement of enzyme activity. Pre- or corequisite: CHM 261†, 361† or approval of instructor. Three hours laboratory.

392 Introduction to Research Techniques. (1-3) F, S, SS
Instrumental methods and philosophy of research by actual participation in chemical research projects. Prerequisite: approval of advisor and research supervisor. May be repeated for a total of 6 credits.

401 Chemical Literature. (1) S
The special information tools available in libraries which permit the researcher to perform an efficient literature search. Topics will include *Chemical Abstracts, Science Citation Index, National Standard Reference Data Series,* patents, computer search services and others. Prerequisite: CHM 318† or 332† or approval of instructor.

421* Instrumental Analysis. (3) S
Principles of instrumental methods in chemical analysis. Electroanalytical and optical techniques. Prerequisites: CHM 225† and 226†. Pre- or corequisite: CHM 442†.

422* Instrumental Analysis Laboratory. (1) S
Experiments in chemical analysis by electroanalytical and optical techniques. Corequisite: CHM 421†. Three hours laboratory.

424 Separation Methods and Quantitative Organic Analysis. (3) F
Theory and practice of gas, liquid, ion-exchange, and gel permeation chromatography, countercurrent distribution, electrophoresis, and distillation; qualitative and quantitative interpretation of IR, mass and NMR spectroscopy; quantitative methods of organic analysis via functional groups. Prerequisites: CHM 318† or 332†, and 442†, or approval of instructor. Two lectures, 4 hours laboratory.

425 Chemical Analysis. (2) F
Principles of chemical equilibria, separations, and analyses; chemical instrumentation. Pre- or corequisites: CHM 341†, or 441†.

426* Chemical and Instrumental Analysis. (3) S
Instrumental techniques for chemical analysis; methods for the interpretation of analytical data. Prerequisite: CHM 425†.

427, 428* Chemical and Instrumental Analysis Laboratory. (2,2) F, S
Classical and instrumental techniques in chemical analyses with emphasis on accuracy and precision. Pre- or corequisites: CHM 425† for CHM 427†; CHM 426† for CHM 428†. One conference, 5 hours laboratory.

431 Qualitative Organic Analysis. (3) F
Systematic identification of organic compounds. Prerequisites: CHM 118† or 226†, and CHM 320† or 336†, or approval of instructor. One lecture, 6 hours laboratory.

438 Polymers. (2) S
Chemistry and properties of natural and synthetic polymers. Prerequisite: CHM 318 or 332.

441, 442 General Physical Chemistry. (3,3) F, S
Gases, liquids, solids, solutions, equilibrium, phase rule, electrochemistry, thermodynamics, atomic structure, radioactivity and colloids. Prerequisites: PHY 112† or 116† or ECE 202†, MAT 274†.

444* General Physical Chemistry Laboratory. (2) S
Physical chemical experiments. Prerequisite: CHM 441†. One conference, 5 hours laboratory.

447* Radiochemistry. (2) F
Radioactivity, natural and artificial radioisotopes, nuclear reactions, isolation of isotopes, nuclear energetics, measurement of radioactivity, tracer techniques and other applications. Prerequisite: CHM 118, CHM 225, PHY 361 or MEE 411.

448 Radiochemistry Laboratory. (2) N
Radiation measurements, tracer methods, quantitative identification of isotopes, and other procedures applicable to chemical, physical, engineering and biological problems. Corequisite: CHM 447†. One conference, 5 hours laboratory.

452 Inorganic Chemistry Laboratory. (2) S
Preparation and purification of typical inorganic substances emphasizing methods and techniques. Prerequisite: approval of instructor. One conference, 5 hours laboratory.

453 Inorganic Chemistry. (3) F, S
Principles and applications of inorganic chemistry. Prerequisites: CHM 341† or 441†.

461, 462 General Biochemistry. (3, 3) F, S
Fundamental chemistry and metabolism of major biological materials and their role in the biochemical processes of living organisms. Prerequisites: CHM 318† or 332†, and CHM 341† or 441† or approval of instructor.

467, 468 General Biochemistry Laboratory. (2, 2) F, S
The application of modern chemical and physical methods to biochemical problems; purification and characterization of biological macromolecules; quantitative measurement of enzyme activity and properties; evaluation of metabolic processes. Corequisites: CHM 461† with 467†; 462† with 468†. One conference, 5 hours laboratory.

471 Solid State Chemistry. (3) F
Crystal chemistry, thermodynamics and electrochemistry of solids, nonstoichiometric compounds, diffusion and solid state reactions, crystal growth and selected topics. Pre- or corequisite: CHM 441†, or approval of instructor.

480 Methods of Teaching Chemistry. (3) N
Organization and presentation of appropriate content of chemistry; preparation of reagents, experiments, demonstrations; organization of stock rooms, laboratories; experience in problem solving. Prerequisite: approval of instructor.

481 Geochemistry. (3) F
Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere. Prerequisite: CHM 341† or 441† or GLG 321. (Same as GLG 481.)

482 Physical Geochemistry. (3) N
Applications of thermodynamic and kinetic principles to geochemical processes. Prerequisite: CHM 341† or 441† or GLG 321†. (Same as GLG 482.)

485 Meteorites and Cosmochemistry. (3) N
Chemistry and mineralogy of meteorites and their relationship to the origin of the earth, solar system and universe. Prerequisite: CHM 481† or 482†. (Same as GLG 485.)

501 Current Topics in Chemistry. (1) F, S
Prerequisite: approval of instructor. May be repeated for credit.

521 Computer Interfacing to Chemical Instrumentation. (3) N
Assembly and machine language programming of laboratory-size computers for data acquisition and online, real-time control of chemical instrumentation. Digital logic and timing considerations in hardware interfacing of computers. No prior knowledge of computers or electronics assumed. Sound knowledge of chemical instrumentation desirable. Two lectures, 4 hours laboratory.

523 Advanced Analytical Chemistry. (3) A
Theoretical principles of analytical chemistry. Prerequisites: CHM 225†, and 442†, or their equivalents.

525 Spectrochemical Methods of Analysis. (4) N
Theoretical and practical considerations involving the use of optical instruments for chemical analysis emphasizing emission and absorption spectroscopy. Prerequisite: CHM 442†. Three lectures, 3 hours laboratory.

526 X-Ray Methods of Analysis. (4) N
Theoretical and practical considerations involving the use of X-ray diffraction and spectroscopy for chemical and structural analyses. Prerequisite: CHM 442†. Three lectures, 3 hours laboratory.

527 Electrical Methods of Chemical Analysis. (4) N
Theoretical and practical considerations of polarography, potentiometric, amperometric, and conductometric titrations. Prerequisite: CHM 442†. Two lectures, 6 hours laboratory.

531 Theoretical Organic Chemistry. (3) F
Reaction mechanisms, reaction kinetics, linear free energy relationships, transition state theory, molecular orbital theory, Woodward-Hoffmann rules. Prerequisites: CHM 318† or 332†, and CHM 442†.

532 Theoretical Organic Chemistry. (2) S
Prerequisite: CHM 531†.

536 Natural Products. (2) N
Organic chemistry of such natural products as alkaloids, steroids, terpenes, organic medicinals, and antibiotics. Prerequisites: CHM 532†, 537†, and approval of instructor. May be repeated for credit.

537 Organic Reactions. (3) S
Important synthetic reactions of organic chemistry emphasizing recently discovered reactions of preparative value. Prerequisite: CHM 531†.

541 Advanced Principles of Chemistry I. (3) F
Thermodynamics and kinetics as applied to various areas of chemistry. Prerequisite: CHM 442†.

545 Advanced Principles of Chemistry II. (3) S
Basic quantum theory, chemical bonding and molecular structure. Prerequisite: CHM 442†.

546 Quantum Chemistry. (3) F
Principles of quantum mechanics applied quantitatively to problems of chemical interest. Prerequisite: approval of instructor.

548 Chemical Kinetics. (2) N
Kinetic theory and rate processes. Prerequisite: approval of instructor.

553 Inorganic Chemistry. (3) F
Principles of modern inorganic chemistry and their applications over the entire periodic system. Prerequisites: CHM 442†, and CHM 453†, or their equivalents.

554 Advanced Inorganic Chemistry. (3) N
Elaboration and extension of the more important topics of CHM 553. Prerequisite: CHM 553†.

556 Topics in Inorganic Chemistry. (3) N
Prerequisites: CHM 553† and approval of instructor. May be repeated for credit.

563 Biophysical Chemistry. (3) N
Physical chemistry of macromolecules, especially proteins, nucleic acids and polysaccharides. Thermodynamics, hydrodynamics, and spectroscopy of biopolymers and their relation to structure. Prerequisites: CHM 462† and 442†.

579 Topics in Solid State Chemistry. (2-4) N
Prerequisite: approval of instructor. May be repeated for credit.

581 Isotope Geochemistry. (3) N
Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Prerequisite: approval of instructor. (Same as GLG 581.)

582 Topics in Geochemistry and Cosmochemistry. (3) N
Topics of current interest for students in chemistry and other fields. Sampling of data and thought concerning phase equilibria, element distribution, meteorites, the earth and other planets. Prerequisite: approval of instructor. May be repeated for credit. (Same as GLG 582.)

583 Phase Equilibria and Geochemical Systems. (3) N
Study of natural reactions at high temperatures and pressures; silicate, sulfide and oxide equilibria. Prerequisite: CHM 482†. (Same as GLG 583.)

Special Courses: CHM 294, 298, 394, 398, 484, 492, 493, 494, 498, 499, 590, 591, 592, 593, 594, 598, 599, 790, 792, 799. (See pages 35-36.)
**In each of the following groups, credit is allowed for one course only:* CHM 101, 113, 114 or 117; CHM 114, 115, 116 or 118; CHM 225 or 425; CHM 226 or 427; CHM 231, 317 or 331; CHM 261 or 361; CHM 318 or 332; CHM 319 or 335; CHM 320 or 336; CHM 341 or 441; CHM 343 or 444; CHM 421 or 426; CHM 422 or 428; CHM 446 or 447.

Computer Science

A major in computer science is offered in the College of Liberal Arts or the College of Engineering and Applied Sciences. Admission requirement for Computer Science programs are above those established by the University. Contact Department for details.

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Computer Science—For required courses in the major, contact the Computer Science Department.

Faculty and course descriptions are listed on page 221.

Economics

A major in economics is offered in the College of Liberal Arts or the College of Business Administration.

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Economics—Consists of 45 semester hours of credit, of which 30 must be in economics and 15 in closely related fields to be approved by the advisor in consultation with the student.
ECN 111, 112, 313, and 314 are required. Also, one course in statistics (e.g., STP 226 or QBA 221) and the equivalent of MAT 210 are required. (See Degree Requirements, page 53.)

Bachelor of Science Degree Curriculum

Economics—Consists of 45-55 semester hours of credit, of which 30 must be in economics and the remainder in closely related fields to be approved by the advisor in consultation with the student. ECN 111, 112, 313 and 314 are required. Also, one course in statistics (e.g., STP 226 or QBA 221) and the equivalent of MAT 210 are required. (See Degree Requirements, page 53.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum (Secondary Education)

Economics—Consists of 45 semester hours of credit including a minimum of 30 in economics and one course in methods of teaching economics. Remainder will be in closely related fields as approved by the advisor in consultation with the student. ECN 111, 112, 200, 313 and 314 are required. Also, one course in statistics (e.g., STP 226 or QBA 221) and the equivalent of MAT 210 are required.

Departmental Minor Teaching Field Requirements

(Secondary Education)

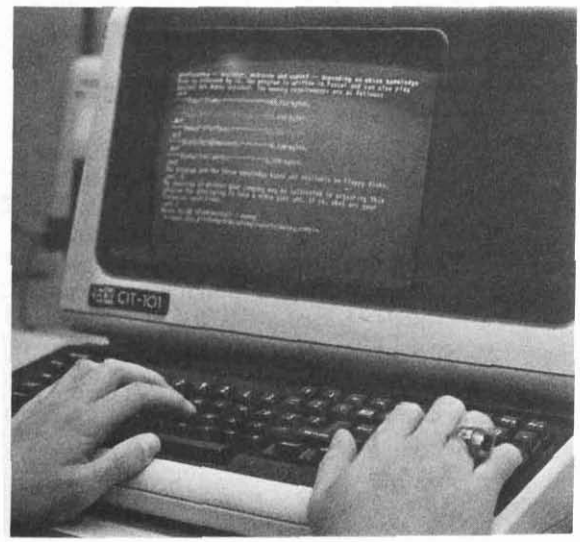
Economics—Consists of 18 semester hours of credit. ECN 111, 112, and 200 are required. Remainder to be approved by the advisor in consultation with the student.

Latin American Studies Emphasis. (See Interdisciplinary Studies, page 82.)—Consists of the Bachelor of Arts degree requirements in Economics. At least 30 upper division semester hours of the total program must be in Latin American content courses, including 15 hours in Economics and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required, and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in Economics—Latin American Studies Emphasis.

Departmental Graduate Programs

The Department of Economics offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

Faculty and course descriptions are listed on page 181.



English

PROFESSORS:
SALERNO (LL B-504), BRACK, J. BRINK, D'ANGELO, B. DOEBLER, J. DOEBLER, DONELSON, DUBIE, ERNO, EVANS, FERRELL, FISHER, FLETCHER, HABERMAN, M. HARRIS, HELMS, KEHL, LIGHTFOOT, NEBEKER, NEY, NILSEN, SHAFER

ASSOCIATE PROFESSORS:
BENDER, BOYER, D. BRINK, BUCKINGHAM, DOVE, FALTZ, J. GREEN, M. GREEN, GREENE, HAKAC, HERMAN, JANSSEN, JOHNSON, MORAN, MURRAY, OJALA, RANDALL, SANDS, SHINN

ASSISTANT PROFESSORS:
ADAMS, BAROODY, BJORK, BROSE, COLBY, NELSON, RIOS

INSTRUCTOR:
K. HARRIS

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

English—Consists of 45 semester hours of credit; 36 of these hours must be in English, 9 hours in a related field to be chosen in consultation with the student's departmental advisor. Required courses are ENG 200, 221 and 222, 421 or 422, 312 or 314 or 413 or 424, a course in English literature before 1660, a course in English literature between 1660 and 1900, 341 or 342 or a course in American Literature before 1900. *No course may be used to satisfy more than one requirement.* At least 18 hours must be in upper division courses. (See Foreign Language Requirement, page 53.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

English—Consists of 42 semester hours of credit in English. Required courses are ENG 200, 211 or 212, 221, 222, 312 or 314, 341, 342, 421 or 422, 471, 480, and 12 hours of electives (all chosen from English department courses), nine of which must be upper division.

Departmental Minor Teaching Field Requirements

(Secondary Education)

(Recommended for Elementary Education)

English—Consists of 24 semester hours of credit. Required courses are ENG 200, 211 or 212, 221 or 222, 341 or 342, 312 or 314, 471 and 480, and an additional upper division elective in English.

Departmental Graduate Programs

The Department of English offers programs leading to the degrees of Master of Arts (with emphases in literature, comparative literature, teaching of English as a second language, linguistics, and creative writing) and Doctor of Philosophy (with numerous emphases).

English Literature in Transition. Currently two major professional journals have editorial offices in the Department of English. *English Literature in Transition: 1880-1920* has been at ASU since 1971 and *English Journal* since 1980. Graduate and undergraduate students have gained editorial experience and research opportunities through the presence of these journals.

ENGLISH

ENG 101 First-Year Composition. (3)
Discovering, organizing, and developing ideas in relation to the writer's purpose, subject, audience. Emphasis on modes of written discourse and effective use of rhetorical principles. Foreign students see ENG 107.

102 First-Year Composition. (3)
Critical reading, analysis, and writing about a variety of materials, with emphasis on style and kinds of written discourse. Research paper required. Foreign students see ENG 108. Prerequisite: ENG 101.

105 Advanced First-Year Composition. (3) F, S
A concentrated composition course for students with superior writing skills; intensive reading; research papers; logical and rhetorical effectiveness. Not open to students with credit in Freshman Composition. Prerequisite: see page 53.

107 English for Foreign Students. (3) F, S
For students from non-English speaking countries who have studied English in their native countries, but who require practice in the idioms of English. Intensive reading, writing and discussion. Satisfies the graduation requirement of ENG 101.

108 English for Foreign Students. (3) F, S
Reading on a broader scope and more emphasis on composition. Satisfies the graduate requirement of ENG 102. Prerequisite: ENG 107.

110 Introduction to Literature. (3) F, S
Introduction to literature through literary types; selections taken mainly from modern writers.

200 Critical Reading and Writing About Literature. (3) F,S
Introduction to the terminology, methods, and objectives of the study of literature; with practice in interpretation and evaluation. Prerequisite: one semester of First-Year Composition.

201 World Literature. (3) F
The classical and medieval periods. Selections from the great literature of the world in translation and lectures on the cultural background.

202 World Literature. (3) S
The Renaissance and modern periods. Selections from the great literature of the world in translation and lectures on the cultural background.

204 Literature of Today. (3) F, S
Poetry, short story, novel and drama. Not for English majors. Not open to freshmen.

210 Introduction to Creative Writing. (3) F, S
Beginning writing of poetry and fiction. Separate sections for each genre. May be taken once for poetry, once for fiction.

211 Advanced Composition. (3) F, S
Further training in organization and expression of ideas. Primarily for non-English majors. Prerequisite: ENG 102†. Two lectures, conferences arranged.

212 English Prose Style. (3) F, S
Analysis and practice of writing in various classical and modern prose styles. Prerequisites: Grade of "B" in ENG 102†, English major or approval of advisor and instructor. Two lectures, conferences arranged.

213 Introduction to the Study of Language. (3) F, S
Language as code; phonetics, phonology, morphology, and syntax; the lexicon; language acquisition; and sociolinguistics.

221 Survey of English Literature. (3) F, S
Medieval, Renaissance, and Eighteenth Century literature. Emphasis on major writers and their works in their literary and historical contexts.

222 Survey of English Literature. (3) F, S
Romantic, Victorian, and Twentieth Century literature. Emphasis on major writers and their works in their literary and historical contexts.

301 Writing for the Professions. (3) F, S
Advanced practice in writing and editing expository prose. Primarily for preprofessional majors.

303 Classical Backgrounds of English Literature. (3) F
Selected readings of Greek and Latin literature in translation, emphasizing forms, ideas, and myth, as they relate to literature in English.

307 Utopian Literature. (3) N
Selected works from the present to the classical period, including *Walden Two, Walden, Utopia,* and *The Republic.* Primarily for non-majors.

310 Intermediate Creative Writing. (3) F, S
Lectures, writing assignments, discussion, criticism. Separate sections for fiction and poetry. May be taken once for poetry, once for fiction. Prerequisite: ENG 210 or approval of instructor.

312 English In Its Social Setting. (3) F, S
Introduction to the sociolinguistic study of the English language. Prerequisite: junior standing or permission of the instructor.

314 Modern Grammar. (3) F, S
Modern descriptive models of English grammar. Prerequisite: junior standing or permission of the instructor.

321 Introduction to Shakespeare. (3) F, S
Shakespeare's major comedies, histories and tragedies. Not open to English majors.

341 American Literature. (3) F, S
From Colonial times to the Civil War, including the growth of nationalism and romanticism.

342 American Literature. (3) F, S
From the Civil War to the present. Development of realism, naturalism, and modernism, and contemporary trends in prose and poetry.

345 Selected Authors or Issues. (3-4) N
Different topics may be offered. Film topics with lab may carry 4 credits. Repeat credit for different topics.

352 Short Story. (3) F, S
Development of the short story as a literary form; analysis of its technique from the work of representative authors.

355 History of the Drama. (3) S
Development of European drama from the Greek to the Romantic Period.

356 Biblical Backgrounds of Literature. (3) F, S
Readings in Old and New Testaments, emphasizing ideas, literary types and sources as they appear in literature.

357 Introduction to Folklore. (3)
Survey of the history, genres, and dynamics of folklore with emphasis on oral traditions.

358 Afro-American Literature. (3) N
Thematic and cultural study of Afro-American literature.

359 American Indian Literatures. (3) S
Selected oral traditions of American Indians and their influences on contemporary Native American literary works.

360 History of Film. (4) F
Emphasis on American film, with some study of European film. Three lectures, four hours of screening.

361 Silent Film. (4) F
Development of motion pictures from 1850 through 1930. Three lectures, screenings.

362 Sound Film Genres. (4) S
Examination of the Western, the horror film, the comedy, and other genres. Three lectures, screenings.

400 History of Literary Criticism. (3) S
Major critics and critical traditions in the western world. Prerequisite: 6 hours of literature or approval of instructor.

405 Style and Stylistics. (3) N
Linguistic, rhetorical, and literary approaches to the analysis of style in poetry, fiction, and other forms of written discourse.

409 Writing for Film. (3) N
Fiction writing within a screenplay format. Lectures, conferences, film viewing exemplary screenplays, and visiting writers from the film community.

411 Advanced Creative Writing. (3) F, S
Separate poetry and fiction workshops for experienced writers, emphasizing individual style. May be taken once for poetry, once for fiction. Prerequisite: ENG 310 or approval of instructor.

412 Professional Writing. (3) N
Lectures and conferences concerning techniques of writing for publication. Prerequisite: ENG 310 or approval of instructor.

413 History of the English Language. (3) F, S
Development of English from the earliest times to the modern period. Prerequisite: junior standing or permission of instructor.

415 Medieval Literature. (3) F
Medieval English literature in translation, from Beowulf to Malory (excluding Chaucer), emphasizing cultural and intellectual backgrounds; includes continental works.

418 Renaissance Literature. (3) F
Poetry and prose, 1485-1603, excluding the drama. Humanism, major genres; More, Sidney, Spenser, and other representative writers. Prerequisite: ENG 221 or consent of instructor.

419 English Literature in the Early Seventeenth Century. (3) S
Prose and poetry, exclusive of Milton and the drama. Metaphysicial, Cavalier, neo-classical verse; Donne,

Jonson, Bacon, and other representative writers. Prerequisite: ENG 221 or consent of instructor.

420 Renaissance Drama. (3) S
Sixteenth and seventeenth century drama. Marlowe, Kyd, Jonson, and other represenatitive writers, exclusive of Shakespeare.

421 Shakespeare I. (3) F, S
A selection of comedies, histories, and tragedies including *Midsummer Night's Dream, Henry IV, Hamlet,* and *Macbeth.*

422 Shakespeare II. (3) F, S
A selection of comedies, histories, and tragedies including *Twelfth Night, King Lear, The Tempest,* and *Othello.*

423 Milton. (3) F, S
Selected prose and poetry, emphasizing *Paradise Lost, Paradise Regained,* and *Samson Agonistes.*

424 Chaucer. (3) F, S
Chaucer's language, poetry and intellectual background.

425 Romantic Poetry. (3) F
Poetry of Wordsworth, Coleridge, Shelley, Keats, Byron.

426 Victorian Poetry. (3) S
Poetry of the second half of the 19th century. Special study of Tennyson, Browning, Arnold.

427 Age of Johnson. (3) S
Chief writers, movements, and books during Johnson's career as a dominating literary figure, together with their most important relationships to predecessors and followers.

428 Age of Dryden, Swift, and Pope. (3) F
Chief writers and movements in the nondramatic literature of the Restoration and early 18th century.

430 19th Century British Cultural Backgrounds. (3) N
Selected works by writers such as Burke, Lamb, Carlyle, Ruskin, Mill, Morris, Darwin, Pater, and Yeats. Prerequisite: ENG 222 or approval of instructor.

435 19th Century American Poetry. (3) F
Themes and developments in American poetry to 1900, including Poe, Whitman, and Dickinson.

439 Drama from Dryden to Sheridan. (3) S '86
English drama of the Restoration and 18th century, especially critical theories and social forces affecting the stage.

440 American Literature to 1815. (3) N
Thought and expression from the time of the first English-speaking colonies to 1815.

441 20th Century American Drama. (3) N
American drama since World War I, especially experimental techniques.

442 20th Century British Poetry. (3) F
Major British poets of the period: techniques, aims and significance.

443 American Poetry, 1900-1945. (3) F
Developments in theory and practice of major poets.

444 American Romanticism, 1830-60. (3) F
Art and ideas of major American transcendentalists and romantics.

445 American Realism, 1860-1900. (3) S
Writers and influences that shaped the development of literary realism.

448 20th Century British Novel. (3) S
Twentieth century British novel since 1914.

451 The Novel to Jane Austen. (3) F
From origins of prose fiction through the 18th century.

452 The 19th Century Novel. (3) S
From Scott to Conrad.

453 The American Novel to 1900. (3) F
The rise and development of the novel to Dreiser.

454 The American Novel, 1900-1945. (3) F
Developments in theory and practice of major novelists.

455 The Form of Verse: Theory and Practice. (3) N
Types, history, criticism and schools of theory of metrical form. Analysis of lyric, narrative and dramatic poetry.

457 American Poetry Since 1945. (3) S
Major American poets of the period: developments in theory and practice.

458 American Novel Since 1945. (3) S
Major novelists of the period: developments in theory and practice.

460 Western American Literature. (3) S
Critical examination of ideas and traditions of the literature of the western United States, including the novel.

461 Women and Literature. (3) N
Selected topics in pre-20th century literature by or about women. May be repeated for credit when topics vary.

463 European Drama from Ibsen to 1914. (3) N
Chief continental and British dramatists of the period: the beginnings and development of realism.

464 European Drama from 1914 to the Present. (3) N
Chief continental and British dramatists of the period, emphasizing experimental techniques.

465 Film Analysis. (3) N
Understanding and enjoyment of film and its correlation to literature, art, music, and other disciplines.

471 Literature for Adolescents. (3) F, S
Prose and poetry which meet the interests and capabilities of junior high and high school students. Recent literature stressed.

480 Methods of Teaching English. (3) F, S
Methods of instruction, organization and presentation of appropriate content in English. Prerequisite: ENG 312 or 314 or 413.

485 Teaching of English as a Second Language. (3) F
Nature of language learning, testing, analysis of differences between two languages as a basis of instruction. Problems of cultural orientation. Prerequisite: teaching experience or approval of the instructor.

500 Research Methods. (3) S
Methodology and resource materials for research. Analysis of criticism and scholarship, including evaluation of sources. Special sections for literature and for linguistics.

501 Introduction to Comparative Literature. (3) N
Problems, methods, and principles, illustrated by selected critical essays and literary texts.

505 American English. (3) S
Development of the English language in America including a survey of geographical and social dialects.

507 Old English. (3) F
Elements of Old English grammar, with selected readings.

508 Old English Literature. (3) N
Intensive literary, linguistic, and cultural study of Old English literature with special emphasis on *Beowulf.* Prerequisite: ENG 507.

509 Middle English. (3) S
A study of the principal dialects of the language, with selected readings. Prerequisite: Graduate Status.

510 The Structure of English. (3) F
Grammatical patterns of English, particularly current linguistic approaches. Prerequisite: ENG 314, or its equivalent.

511 English Phonetics and Phonology. (3) S
Current trends in phonological theory and its basis in acoustic and articulatory phonetics. Prerequisite: ENG 510, or its equivalent, or permission of the instructor.

512 The Teaching of Composition. (3) N
The theory and practice of teaching writing at all levels. Emphasis on current research. Prerequisite: teaching experience and approval of instructor.

513 Semantic Theory. (3) F
Current approaches to linguistic meaning, with particular attention to English. Prerequisite: ENG 510, or its equivalent, or permission of the instructor.

514 Advanced Grammar. (3) S
The analysis of English grammatical structure with contemporary theoretical models. Prerequisite: ENG 510, or its equivalent, or permission of the instructor.

515 Middle English Literature. (3) N
English literature from the 12th through the 15th century, exclusive of Chaucer. Prerequisite: ENG 509 or approval of instructor.

520 Renaissance Literature. (3) S
Poetry and prose of the English Renaissance, excluding drama.

521 Shakespeare. (3) F
A selection of comedies, histories, and tragedies presented in the context of literary history and critical theories, with an emphasis on classical and medieval backgrounds.

525 American Literary Criticism. (3) N; Fisher
Analysis and discussion of leading historical and critical interpretations of American literature from the beginnings to the present.

530 Classical Rhetoric and Written Composition. (3) F
Relationship of major texts in classical rhetoric to developments in composition theory, and literary theory and practice through the nineteenth century.

531 Rhetorical Theory and Literary Criticism. (3) S
Intensive study of major rhetorical theorists of the 20th century in such areas as literary criticism, discourse theory, and composition theory.

532 Composition Theory. (3) N
Intensive study in the rhetorical categories of invention, arrangement, style, aims, modes, and forms of written discourse.

545, 547, 548, 549: (3) N
Selected authors or issues. May be repeated for credit.

545 Studies in English Literature. (3) N

547 Studies in American Literature. (3) N

548 Studies in English Language. (3) N

549 Studies in Comparative Literature. (3) N

550 Contemporary Comparative Literature. (3) F
Comparative studies in modern literature in English and other literatures in translation. May be repeated for credit when content varies.

591 Seminar. (3) F,S
Selected topics regularly offered in the various areas of English studies.

Special Courses: ENG 294, 298, 484, 492, 493, 494, 497, 498, 499, 580, 584, 590, 592, 593, 594, 598, 599, 790, 791, 792, 799. (See pages 35-36.)

HUMANITIES

HUM 110 Contemporary Issues in Humanities. (3) F
Contemporary issues and problems as reflected primarily in literature.

301, 302 Humanities in the Western World. (4,4) F, S
Interrelation of arts and ideas in Western Civilization. HUM 301, Hellenic through Medieval; 302, Renaissance to the present. Two lectures, 2 discussion meetings per week.

413 Comedy: Meaning and Form. (3) S
Nature and characteristics of the experience of comedy: classical, Renaissance, and modern.

414 Tragedy: Meaning and Form. (3) A
Nature and characteristics of literary and artistic expressions called tragic. Prerequisite: HUM 301 and 302 or equivalent.

Foreign Languages

PROFESSORS:
HORWATH (LL B-404), ALARCÓN, BININGER, CARLSON, COUCH, CURRAN, EKMANIS, FLYS, FOSTER, GROBE, MARTINEZ, SHEPPARD, VIRGILLO

ASSOCIATE PROFESSORS:
AHERN, ALEXANDER, BALDINI, CARVER, CROFT, FRIEDMAN, GUNTERMANN, HENDRICKSON, KNOWLTON, LOSSE, RADKE, REIMAN, RIEGELHAUPT, RODD, SENNER, VALDIVIESO, VASQUEZ, WIXTED, WOLLAM, WONG

ASSISTANT PROFESSORS:
BURTON, COTA-CARDENAS, GRUZINSKA, LAETZ, LAFFORD, SIMMONS, TIPTON

INSTRUCTORS:
HABERMAN, MORGAN, SCHUBACK, TU, WILSON

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Asian Languages (Chinese or Japanese), French, German, Italian, Russian, Spanish—Consists of 45 semester hours of credit, of which 30 must be in one language and 15 in a second language or in closely related fields to be approved by the advisor in consultation with the student. Of the 30 hours required for the major, a minimum of 24 hours must be taken above the 200 level and must include at least 9 hours at the 400 level or above. Specific required courses for each major area are listed in a brochure available in the department. (See Degree Requirements, page 53.)

Asian Studies Emphasis—Consists of the Bachelor of Arts degree requirements in Asian languages. In addition to the required 45 semester hours, 15 hours of Asian content courses selected with the approval of the student's advisor must be completed. Fulfillment of these requirements will be recognized on the transcript as a major in Asian Languages (Chinese or Japanese)—

Asian Studies emphasis. (For an Asian Studies emphasis in other disciplines, see Asian Studies, page 57.)

Latin American Studies Emphasis (See Interdisciplinary Studies, page 59.)—Consists of the Bachelor of Arts degree requirements in Spanish. At least 30 upper division semester hours of the total program must be in Latin American content courses including 15 hours in Spanish and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required, and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in Spanish—Latin American Studies emphasis.

Mexican American Studies Emphasis—Consists of 45 semester hours of credit, of which 30 hours must be in Spanish (to include SPA 421, 464, and 471) and 15 hours in Mexican American content courses as related fields. Fulfillment of requirements is recognized on the transcript as a major in Spanish—Mexican American Studies emphasis.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Asian Languages (Chinese or Japanese), French, German, Russian, Spanish—Consists of 45 semester hours of credit, of which 30 must be in one language and 15 in a second language or in closely related fields to be approved by the advisor in consultation with the student. Of the 30 hours required for the major, a minimum of 24 hours must be taken above the 200 level and must include at least 9 hours at the 400 level or above. Specific required courses for each major area are listed in a brochure available in the department.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Consists of a minimum of 24 semester hours of credit in one foreign language of which at least 18 hours must be taken above the 200 level (see departmental brochure for listing of required courses in each minor area).

Departmental Graduate Programs

The Department of Foreign Languages offers programs leading to the degrees of Master of Arts in French, German, and Spanish and the Doctor of Philosophy degree in Spanish. Consult the *Graduate College Catalog* for requirements.

Foreign Languages for International Professions

The sequence of two semesters, listed under numbers 107 and 207 in five languages (Chinese, French, German, Japanese, and Spanish), integrates an accelerated study, a functional approach to course design, and preparation for international professions (e.g., business, diplomacy, international political economy). It is parallel to the traditional sequence of 101 through 202 and will also satisfy the Liberal Arts foreign language requirement for the B.A. degree. The sequence differs from traditional basic language programs in that all aspects of the language—vocabulary, grammar, and skill development—are practiced within the context of authentic communication for social and professional purposes in the target culture. Classes meet eight hours weekly, for 8 credit hours in each of two semesters (ten hours weekly, for 10 credit hours in Chinese and Japanese).

Students must be beginners in the language, but those who have had success in learning one foreign language are encouraged to join this program in a second language. Students should contact the Department of Foreign Languages prior to registration.

Certificate Program in Translation

The Certificate Program in Translation is designed to provide the advanced training required for professional translation in both public and private sectors, preparation for the rigorous examinations required by national and international agencies, and training as an ancillary skill for professional fields, such as international business, public health and medicine, law, etc., in accordance with guidelines recommended by the American Translators' Association. The certificate is a nondegree program consisting of 15 credit-hours of course work and two hours of in-service practicum primarily into the receptor language of English from the source languages of French and Spanish. It may be taken simultaneously with course work leading to an undergraduate or gradu-

ate degree, as a related area sequence, or as the sole program of study for members of the community who meet the admission requirements of the certificate program, but who are not enrolled in a degree program.

Admission Requirements. Since entrance to professional translation is through work, and cultural experience and examination, the two entrance requirements to this certificate program are: 1) A written proficiency examination in the source and the receptor languages at the level of completion of the fourth year or most advanced composition course in French or Spanish, which at Arizona State University are FRE 412 and SPA 412. 2) *One* of the following: a) an academic year at a university in a French-speaking or Spanish-speaking country; b) extensive work experience using French or Spanish; or c) demonstrated bilingual facility, both written and oral, in English and either French or Spanish.

Certificate Requirements. The certificate program consists of 15 credit hours of required courses: six hours general theory of linguistics and translation as a profession (FLA 400, 401), nine hours of applied translation electives in specialized areas (FLA 481, 482, 483, 485), and two hours of in-service practicum (FLA 484).

Foreign Language Requirement and Placement

For the degree of Bachelor of Arts, the College of Liberal Arts requires knowledge of one foreign language equivalent to the completion of two years' study at the college level. This normally includes a sequence of courses numbered 101, 102, 201, and 202 or 107 and 207. For important exceptions in French, Greek, and Portuguese, see statement at head of respective course descriptions. Courses taken to satisfy the foreign language requirement for the B.A. degree will not count toward the General Studies requirements.

Students who have completed their secondary education in a school where a foreign language was the official language of instruction will be considered as having satisfied the foreign language requirement. (See page 53.)

Languages not taught at Arizona State University will be accepted only as transfer credit, or upon successful passing of a proficiency examination, from an approved university. (See page 53.)

Ordinarily, no placement or proficiency examination is administered to students who wish to continue studying a foreign language for which high school credits have already been received. Students should be guided by the following principles of equivalency:

(1) One unit (one academic year) of high school-level study will be considered, for placement purposes only, to equal one semester of study of the same language at the university level. Thus, students with one year of high school study would enroll in the second semester course (102); with two years of high school study, in the third semester course (201), etc.

(2) Students who feel that their high school language preparation was inadequate may choose to place themselves on a lower level, but not lower than 111 with two or three years of high school study and 201 with four years of high school study.

Students will not receive university credit for foreign language studies undertaken in violation of these equivalency principles.

Students with prior knowledge of a language may have all or part of their requirement waived in any one of the following ways: (1) by satisfactory results in a departmental proficiency examination; (2) by achieving a grade of at least C in the last course of the required sequence (*e.g.*, GER 102 or 111 for the B.S. in Chemistry, 202 for the B.A.); or (3) by achieving a grade of at least C in a course at the next higher level (*e.g.*, any 300 level course for the B.A.).

If college transfers are uncertain about course equivalencies, they should contact the Department of Foreign Languages.

Language Laboratory Requirement

All students enrolled in 101, 102, 201 and 202 language courses must spend a minimum of one hour per week in the language laboratory in addition to the regular class periods.

FOREIGN LANGUAGES

FLA 150 Introduction to East Asian Culture. (3) S
An introduction to the cultures of China, Japan, and Korea.

323 Survey of Soviet Literature in Translation. (3) F, S
Knowledge of Russian is *not* required. Survey of the main literary movements, prominent authors, and the most significant works of prose, poetry and drama of the Soviet period (1917 to present).

400 Linguistics. (3) S
Surveys major theories of current linguistic study and explores their application to specific issues of English, the Romance Languages, and language teaching. Open to sophomores and juniors with approval of instructor.

401 Translation Theory and Practice. (3) N
Translation theories and professional practices and ethics; bibliography, computer technology and sample texts for natural and social sicences and humanities. Prerequisite: fourth year composition or approval of instructor in respective language area.

415 Bilingualism and Languages in Contact. (3) F
Analysis of linguistic aspects of bilingualism, e.g., pidgins and creoles, code-switching, and other contact phenomena; simultaneous/sequential bilingual language acquisition. Prerequisite: FLA 400 or equivalent, or approval of instructor.

420 Foreign Literature in Translation. (3) F, S
Not for language majors (except in Asian languages and Russian); open to language majors as a related-area course. Graduate students by permission. No prerequisite.

(a)	Brazilian	(h)	Latin
(b)	Chinese	(i)	Portuguese
(c)	French	(j)	Russian
(d)	German	(k)	Soviet
(e)	Greek	(l)	Spanish
(f)	Italian	(m)	Spanish-American
(g)	Japanese		

480 Methods of Teaching Foreign Languages. (3) F
Teaching foreign languages and literatures at secondary and college levels. This course will not meet the Liberal Arts General Studies requirement for Humanities and Fine Arts. Required for admission to SED 433. Prerequisite: 12 hours of upper division courses in one foreign language.

481 Technical and Scientific Translation. (3) N
Resources, practices, strategies, and lexicon for translation of professional texts: engineering, architecture, agriculture, computer technology, electronics, physical and biological sciences, etc. Prerequisite: FLA 401†.

482 Business and Financial Translation. (3) N
Resources, practices, strategies, and lexicon for translation of professional texts: economics, finance, insurance, management, marketing, accounting, advertising, real estate, etc. Prerequisite: FLA 401†.

483 Medical and Legal Translation. (3) N
Resources and strategies for translation of professional texts: medicine, nursing, public health, criminal justice, international law, etc. May be repeated for a total of six hours credit. Prerequisite: FLA 401†.

485 Problems of Literary Translation. (3) N
Theory and practice with emphasis on application through individual translation projects. May be repeated for a total of six hours credit. Prerequisite: approval of the instructor in the respective language area.

515 Second Language Acquisition. (3) S
Description and analysis of bilingual language acquisition and learning simultaneously or sequentially in natural and artificial settings. Prerequisite: FLA 400 or equivalent, or approval of instructor.

525 Trends and Issues in Foreign Language Teaching. (3) N
Advanced methods seminar, designed for experienced teachers.

Special Courses: FLA 294, 394, 494, 497, 498, 499, 591. (See pages 35-36.)

CHINESE

CHI 101, 102 Elementary Chinese. (5,5) F, S
Pronunciation, grammar, elementary conversation, development of basic reading and writing skills. Standard dialect. Five lectures, 1 hour laboratory.

107 Chinese for International Professions I. (10) F
Accelerated program alternative to CHI 101, 102 sequence. Functional approach to needs of international professions.

201, 202 Intermediate Chinese. (5,5) F, S
Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. Prerequisite: CHI 102† or equivalent. Five lectures, 1 hour laboratory.

205 Chinese Calligraphy. (1) F, S
An introduction to styles and techniques of Chinese writing. Knowledge of Chinese or Japanese is not required.

207 Chinese for International Professions II. (10) S
Continuation of CHI 107, alternative to CHI 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Prerequisite: CHI 107 or approval of instructor.

309, 310, 311, 312 Chinese Conversation. (2, 2, 2, 2) F, S
Intensive aural/oral drills towards conversational fluency in modern Chinese. To be offered in rotation, with each course covering different situations and vocabulary. Prerequisite: CHI 202†.

313, 314 Advanced Chinese. (3,3) F, S
The modern language in general, or specific areas depending on the student's needs or interests. Prerequisite: CHI 202† or equivalent. Three lectures plus arranged laboratory.

321, 322 Chinese Literature. (3, 3) F, S
Selected representative works of the various genres and periods. Prerequisite: CHI 202† or approval of instructor.

413, 414 Introduction to Classical Chinese. (3, 3) F, S
Reading in various genres of pre-20th century wen-yen, with analysis of its structural characteristics. Prerequisite: CHI 202† or the equivalent.

Special Courses: CHI 294, 394, 492, 493, 494, 499, 590. (See pages 35-36.)

FRENCH

Any two of the 200-level courses may be taken in any order or simultaneously to satisfy the Liberal Arts language requirements.

FRE 101, 102 Elementary French. (4-4) F, S, SS
Intensive aural/oral drill in class and laboratory; basic grammar supplemented by simple prose readings. Not open to students with credit in FRE 111. Four lectures, 1 hour laboratory.

107 French for International Professions I. (8) F
Accelerated program alternative to FRE 101, 102 sequence. Functional approach to needs of international professions.

111 Fundamentals of French. (4) F, S
Primarily for students with two years of high school French who need review to enter second year study. Not open to students with credit in FRE 102. Four lectures, 1 hour laboratory.

201 Intermediate Grammar Review. (4) F, S, SS
A thorough review of French grammar, including full attention to literary usage. Prerequisite: FRE 102†, 111 or equivalent. Four lectures, 1 hour laboratory.

202 Intermediate Reading. (4) F, S
Extensive reading in 19th and 20th century literary and cultural texts. Designed to increase the student's vocabulary and to teach prompt recognition of stylistic usages and grammatical structures. Prerequisite: FRE 102†, 111 or equivalent.

203 French Conversation. (4) F, S, SS
Current usage in expression of ideas. Especially recommended for students who plan to travel in French-speaking countries or who desire supplementary practice in speaking and understanding before advancing to 300-level courses. Prerequisite: FRE 102†, 111 or equivalent. One hour laboratory required.

207 French for International Professions II. (8) S
Continuation of FRE 107, alternative to FRE 201, 203 sequence. Expansion of communicative proficiency in specific ares of international professions. Prerequisite: FRE 107 or approval of instructor.

311 French Conversation. (3) F, S
Further practice in speaking French, emphasizing current usage and promoting facility in the expression of ideas. One hour laboratory work required. Prerequisites: FRE 203†, and 201† or 202†, or equivalents.

312 French Composition. (3) F, S
Further practice in writing French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: eight hours of 200-level French, including 202† or equivalents.

319 Business Correspondence and Communication. (3) S
Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: FRE 312† or approval of instructor.

321, 322 French Literature. (3-3) F, S
Representative masterpieces and significant movements of French literature. Prerequisite: FRE 202†, plus either FRE 203† or FRE 311†, or equivalents.

410 French Phonetics and Diction. (2) F '86
Theory and practical application. Prerequisites: FRE 311†, 312†, or equivalents.

411 Advanced Spoken French. (3) F
Improvement of spoken French. Prerequisites: nine hours of 300-level French, including FRE 311†, or equivalents.

412 Advanced Written French. (3) S
Improvement of composition skills. Prerequisites: nine hours of 300-level French, including FRE 312† or equivalents.

415 French Civilization. (3) S '87
Political, intellectual, social, economic and artistic development of the French nation from its origins to the present. Prerequisite: six hours of upper division French.

431 French Women in Society and the Arts. (3) N
Outstanding French women who have contributed to the shaping of society and the arts from the Middle Ages to present. Prerequisite: nine hours of 300-level French, including FRE 321†, 322†, or approval of instructor.

441 French Literature of the 17th Century. (3) F '86
From 1600 to 1660. Prerequisite: nine hours of 300-level French including FRE 321†, or approval of instructor.

442 French Literature of the 17th Century. (3) S '87
From 1660 to 1700. Prerequisite: nine hours of 300-level French, including FRE 321†, or approval of instructor.

445 French Literature of the 18th Century. (3) F '86
Contributions of the philosophers, development of the novel and drama. Prerequisite: nine hours of 300-level French, including FRE 321†, or approval of instructor.

451 French Poetry of the 19th Century. (3) S '87
From Romanticism to Parnassian poetry to Symbolism. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

452 French Novel of the 19th Century. (3) S '86
From Constant, Hugo, Balzac, Stendhal, and Sand to Flaubert and Zola, with emphasis on major literary movements. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

453 Theater of the 19th Century. (3) N
From Romantic drama to the Symbolist Theater. Representative plays of Hugo, Musset, Vigny, Dumas, Becque, Rostand, Feydeau and Mirbeau. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

461 Pre-Atomic Literature. (3) F '85
Representative authors from Proust, Malraux to Sartre, from 1900 to 1945. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

462 Post-Atomic Literature. (3) S '86
Representative authors including Camus, Duras and Robbe-Grillet, from 1945 to present. Prerequisite: nine hours of 300-level French, including FRE 322†, or approval of instructor.

471 The Literature of Francophone Africa and the Caribbean. (3) F '86
Selected prose, poetry and drama of black authors from Africa and the Caribbean. Prerequisite: nine hours of 300-level French including FRE 322†, or approval of instructor.

500 Bibliography and Research Methods. (3) F
Required of all graduate students.

510 Explication de Textes. (3) N
Detailed analysis of literary texts.

515, 516 Intellectual Currents in France, from the Middle Ages Through the 20th Century. (3-3) N
Significant social, esthetic, philosophic, and scientific ideas as presented by major writers of fiction and nonfiction.

521 History of the French Language. (3) N
Principal phonological, morphological and semantic developments of French from its Latin origins to the present. Prerequisite: some familiarity with Latin recommended.

531 Medieval French Literature. (3) F '85
Readings in the epics, early drama, roman courtois and other representative literary genres of the Middle Ages.

535 French Literature of the 16th Century. (3) S '86
Readings in French Renaissance literature with special attention to the humanist movement and to Rabelais, Montaigne and the Pleiade.

591 Seminar. (3) N
Topics may be selected from the following:

(a) French Literary Criticism
(b) Corneille, Molière and Racine
(c) Diderot, Voltaire and Rousseau
(d) Balzac
(e) Romanticism
(f) Proust
(g) Realism and Naturalism

(h) French Existentialist Literature
(i) Advanced Problems in French Literature
(j) Flaubert
(k) Stendhal and Zola

Special Courses: FRE 294, 394, 492, 493, 494, 498, 499, 590, 592, 598, 599. (See pages 35-36.)

GERMAN

GER 101, 102 Elementary German. (4-4) F, S, SS
Reading, writing, speaking and understanding of basic German with emphasis on pronunciation and grammar. Not open to students with credit in GER 111. Four lectures, 1 hour laboratory.

107 German for International Professions I. (8) F
Accelerated program alternative to GER 101, 102 sequence. Functional approach to needs of international professions.

111 Fundamentals of German. (4) F, S
Primarily for students with two years of high school German who need review to enter second year study. Not open to students with credit in GER 102. Four lectures, 1 hour laboratory.

201, 202 Intermediate German. (4-4) F, S, SS
Intensive review of grammar with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. Prerequisite: GER 102† or 111 or equivalent. Four lectures, 1 hour laboratory.

207 German for International Professions II.(8) S
Continuation of GER 107, alternative to GER 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Prerequisite: GER 107 or approval of instructor.

303, 304 Scientific German. (3-3) F, S
Acquisition of a specialized vocabulary through the reading of German scientific publications. Does not satisfy the Liberal Arts language requirement for B.A. degree. Prerequisite: GER 102† or 111.

311, 312 German Conversation. (3-3) F, S
Expansion of idiom through oral practice dealing with contemporary articles, essays, and stories. (Three hour credit limit for majors). Prerequisite: GER 202† or equivalent.

313 German Composition. (3) S
Intensive practice in writing, emphasizing style and grammar. Prerequisite: GER 202† or equivalent.

314 Introduction to German Literature. (3) F
Beginning study of German poetry, drama, the novel and the *Novelle*. Prerequisite: GER 202† or equivalent.

319 Business Correspondence and Communication. (3) S
Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: GER 313† or approval of instructor.

321, 322 German Literature. (3-3) F, S
From the beginning to classicism and from romanticism to the present. Prerequisite: GER 202† or approval of instructor.

411 Advanced Grammar and Conversation. (3) F
Improvement of diction and idiom through intensive oral review. Prerequisite: GER 311† or 312† or equivalent.

412 Advanced Grammar and Composition. (3) S
Improvement of writing ability. Prerequisite: GER 313† or equivalent.

415 German Civilization. (3) S '87
Aspects of political, social and cultural life of the German-speaking world. Prerequisite: any 300-level course in German or approval of instructor.

445 German Literature: Enlightenment to Classicism. (3) F '86
Major works of the literary epochs in the 18th century. Prerequisite: GER 321† or approval of instructor.

451 German Literature: Biedermeier to Naturalism. (3) SS '86
Representative works of prose and poetry from 1820 to 1890. Prerequisite: GER 322† or approval of instructor.

461 Contemporary German Literature. (3) SS '87
German writers since 1945. Prerequisite: GER 322† or approval of instructor.

500 Bibliography and Research Methods. (3) S '87
Required of all graduate students.

511 German Stylistics. (3) S '88
Art of writing literary German, comparative stylistics.

521 History of German Language. (3) F '87
Linguistic development of German from the earliest records to the present.

523 German Drama. (3) F '86
Drama of the 19th and 20th centuries.

525 German Novel. (3) S '86
Special studies in the German novel.

527 The *Novelle*. (3) N
Special studies in the German short story.

531 Middle High German Language and Literature. (3) S '86
Reading and discussion of specimens of the Middle High German epics, romances, and other literary genres.

541 Baroque. (3) F '85
Studies in poetry, prose and drama of the 17th and early 18th centuries.

551 Romanticism. (3) S '88
Treatment of early and late Romanticism.

555 Modern German Literature. (3) F '87
Major works from the period of Expressionism to 1945.

591 Seminar. (3) N
Special topics are concerned with a figure, theme or work in German literature or Germanic studies. Topics may be selected from the following:

(a) Goethe
(b) Faust
(c) Schiller
(d) Kleist
(e) Kafka
(f) Hesse
(g) Grass and Boll
(h) Germanic Studies

Special Courses: GER 294, 394, 492, 493, 494, 498, 499, 590, 592, 598, 599. (See pages 35-36.)

GREEK

Completion of GRK 101, 201; 301, and 302 will satisfy the Liberal Arts language requirements.

GRK 101 Elementary Greek. (4) F
For beginning students only.

201 Intermediate Greek. (4) S
Continuation of GRK 101. Prerequisite: GRK 101 or approval of instructor.

301, 302 Greek Literature. (3-3) F, S
Readings in the masterpieces of ancient Greek literature; advanced grammar. Authors read are changed each year in accordance with needs of the class. May be repeated for credit. Prerequisite: GRK 201† or approval of instructor.

Special Courses: GRK 294, 394, 492, 493, 494, 499. (See pages 35-36.)

ITALIAN

ITA 101, 102 Elementary Italian. (4-4) F, S
Aural/oral drill in class and laboratory, and basic grammar supplemented by simple prose readings. Four lectures, 1 hour laboratory.

201, 202 Intermediate Italian. (4-4) F, S
Intensive review of the fundamentals of Italian grammatical structure to increase the student's ability in composition, translation and idiomatic expression. Prerequisite: ITA 102† or equivalent. Four lectures, 1 hour laboratory.

311, 312 Italian Composition and Conversation. (3-3) F, S
Development of writing ability and oral expression. Prerequisite: ITA 202† or equivalent.

314 Advanced Italian. (3) N
An advanced grammar and composition course with readings of selected literary works. Prerequisite: ITA 202 or approval of instructor.

325 Introduction to Italian Literature. (3) F
Italian literature through the interpretation of representative works in drama, poetry and novel. Prerequisite: ITA 312† or approval of instructor.

415 Italian Civilization. (3) N
A general survey of the history, literature, art, and music, emphasizing Italy's cultural contribution to Western civilization. Prerequisite: 6 hours of upper division Italian.

430 Italian Literature of the Middle Ages. (3) N
Emphasis on "Stil Novo," Dante's minor works, Petrarch and Boccaccio. Prerequisite: ITA 325 or approval of instructor.

441 Dante: *Divina Commedia.* (3) N
Critical reading of the three *Cantiche (Inferno, Purgatorio, Paradiso).* Prerequisite: ITA 325†.

443 Italian Literature of the Renaissance. (3) N
Emphasis on Lorenzo de'Medici, Poliziano Castiglione, Machiavelli, Ariosto and Tasso. Prerequisite: ITA 325 or approval of instructor.

446 Italian Literature of the 18th and 19th Century. (3) N
Goldoni, Parini, Alfieri, the poetry of Foscolo and Leopardi and the socio-historical novel of Foscolo, Manzoni and Verga. Prerequisite: ITA 325 or approval of instructor.

449 20th Century Italian Literature. (3) N
Major works, figures and movements of contemporary Italian literature. Prerequisite: ITA 325†.

Special Courses: ITA 294, 394, 492, 493, 494, 499. (See pages 35-36.)

JAPANESE

JPN 101, 102 Elementary Japanese. (5-5) F, S
Pronunciation, conversation and structural grammar. Aural/oral drill. Graduated introduction of basic reading and writing skills. Five lectures, 1 hour laboratory.

107 Japanese for International Professions I. (10) F
Accelerated program alternative to JPN 101, 102 sequence. Functional approach to needs of international professions.

201, 202 Intermediate Japanese. (5-5) F, S
Grammar review and continued oral practice. Increased emphasis on reading and writing. Prerequisite: JPN 102† or equivalent. Five lectures, 1 hour laboratory.

206 Calligraphy. (1) S '85
Introduction to the practice of calligraphy in Japan with emphasis on the derivation of Japanese *kana* syllabaries from Chinese characters. Prerequisite: CHI 205 or JPN 101.

207 Japanese for International Professions II. (10) S
Continuation of JPN 107, alternative to JPN 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Prerequisite: JPN 107 or approval of instructor.

309, 310 Intermediate Japanese Conversation. (2-2) F '85, S '86
Practice in current usage in expression of ideas. Recommended especially for those who have not had the opportunity to practice Japanese in Japan. Prerequisite: JPN 202†.

311, 312 Advanced Japanese Conversation. (2-2) F '86, S '87
Intensive aural/oral practice toward conversational fluency. Prerequisite: JPN 202†.

313, 314 Advanced Japanese. (3-3) F, S
Designed to develop skill and accuracy in written Japanese. Prerequisite: JPN 202† or equivalent.

321 Japanese Literature. (3-3) F, S
Readings in representative masterpieces of modern Japanese literature. Authors read change each year in accordance with the needs of the class. May be repeated for credit. Prerequisite: JPN 313† or approval of instructor.

414 Introduction to Classical Japanese. (3) S' 87
Readings from various genres of pre-20th century literature, with analysis of the structure of the classical language. Prerequisite: JPN 313† or approval of instructor.

Special Courses: JPN 294, 394, 492, 493, 494, 499, 590. (See pages 35-36.)

LATIN

LAT 101, 102 Elementary Latin. (4-4) F, S
For beginning students only.

201, 202 Intermediate Latin. (4-4) F, S
Selected Latin literature, both classical and post-classical; Vergil's *Aeneid;* advanced grammar. Prerequisite: LAT 102† or approval of instructor.

421, 422 Roman Literature. (3-3) F, S
Readings in the Latin masterpieces. Authors read change each year in accordance with needs of the class. May be repeated for credit. Prerequisite: LAT 202 or approval of instructor.

Special Courses: LAT 294, 394, 492, 493, 494, 499. (See pages 35-36.)

PORTUGUESE

Completion of POR 101, 201, 313, and 314 will satisfy the Liberal Arts Language requirements.

POR 101 Elementary Portuguese. (5) F
Basic grammar with intensive drill in class and laboratory directed toward conversational fluency. Five lectures, 1 hour laboratory. Prerequisite: one year of Spanish, French, or Italian, or approval of instructor.

201 Intermediate Portuguese. (5) S
Continuation of POR 101. Intensive drill of fundamentals in class and laboratory directed toward conversational fluency. Five lectures, 1 hour laboratory. Prerequisite: POR 101 or approval of instructor.

313, 314 Portuguese Composition and Conversation. (3-3) F, S
Designed to develop skill in written Portuguese and corrected oral expression. Must be taken in sequence. Prerequisite: POR 201† or approval of instructor.

321 Luso-Brazilian Literature. (3) S
Representative masterpieces of Portuguese and Brazilian literature from the beginning to the present. Prerequisite: POR 313† or approval of instructor.

472 Luso-Brazilian Civilization. (3) F
Lectures, readings and discussion of important aspects of Luso-Brazilian civilization. Topics from music, art, folklore, literature, history and politics. Prerequisite: POR 313† or approval of instructor.

Special Courses: POR 294, 394, 492, 493, 494, 499, 590. (See pages 35-36.)

RUSSIAN

RUS 101, 102 Elementary Russian. (4-4) F, S, SS
Structural grammar and basic vocabulary. Introduction and reinforcement of aural/oral reading and writing skills. Four lectures, 1 hour laboratory.

201, 202 Intermediate Russian. (4-4) F, S, SS
Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. Prerequisite: RUS 102† or equivalent. Four lectures, 1 hour laboratory.

211, 212 Basic Russian Conversation. (3-3) F, S
Intensive aural/oral drill to supplement reading and grammatical skills acquired in RUS 101, 102†, 201†, and 202†. Required of Russian majors. Prerequisite: RUS 102†.

303, 304 Scientific Russian. (3-3) F, S
Acquisition of scientific vocabulary through reading from current Soviet scientific publications. Does not satisfy the Liberal Arts language requirement for B.A. degree. Prerequisite: RUS 102†.

311, 312 Russian Composition and Conversation. (3-3) F, S
Development of writing ability and oral expression. Prerequisite: RUS 202†.

321, 322 Survey of Russian Literature. (3-3) F, S
The main literary movements, prominent authors and the most significant works of prose, poetry and drama to the 1917 revolution. Prerequisite: RUS 202† or equivalent.

323 Survey of Soviet Literature. (3) F, S
The main literary movements, prominent authors and the most significant works of prose, poetry and drama of the Soviet period (1917 to present). Prerequisite: RUS 202† or equivalent.

411, 412 Advanced Composition and Conversation. (3-3) F, S
Designed to improve aural discrimination, self-expression in oral and written skills, emphasizing vocabulary building. Subject materials drawn from current Soviet publications. Prerequisite: RUS 312†.

417, 418 Applied Russian Phonetics. (2-2) N
General improvement in the student's language skills through aural/oral training in Russian phonology and an analysis of Russian orthography. Prerequisite: RUS 312†.

420 Russian Poetry. (3) N
Development of Russian poetry from its beginnings to the present, including both native and emigré poets. Topics in criticism and the study of poetics. Prerequisite: RUS 312† or approval of instructor.

421 Pushkin. (3) N
Pushkin's poetry, plays and prose fiction, including *Eugene Onegin, The Little Tragedies, Tales of Belkin, Queen of Spades* and *The Captain's Daughter.* Taught in English. Does not satisfy the Liberal Arts language requirement for B.A. degree.

423 Dostoyevsky. (3) N
Dostoyevsky's major works of fiction, including *Crime and Punishment* and *Brothers Karamazov.* Taught in English. Does not satisfy the Liberal Arts language requirement for B.A. degree.

424 Tolstoy. (3) N
Tolstoy's major works, including *War and Peace* and *Anna Karenina.* Taught in English. Does not satisfy the Liberal Arts language requirement for B.A. degree.

425 Chekhov. (3) N
Chekhov's major works, representative short stories and major plays, including *The Cherry Orchard* and *Three Sisters.* Taught in English. Does not satisfy the Liberal Arts language requirement for B.A. degree.

426 Soviet Dissident Literature (1917—Present). (3) N
Including such authors as Khvylovy, Pasternak, Sinavsky, Daniel', Voinovich, Zinov'ev, Belsevica, Venclova, and others. Prerequisite: RUS 312† or approval of instructor.

430 Russian Short Story. (3) N
Detailed study of representative works of the Russian short story genre. Authors included are from both Imperial and Soviet Russia. Prerequisite: RUS 312†.

440 History of the Russian Language. (3) N
Principles of historical linguistics presented through the evolution of the Russian language from Proto-Indo-European to the present. Readings of historical documents in Old Russian and Old Church Slavic. Prerequisite: RUS 312† or approval of instructor.

441 Survey of Russian Culture. (3) N
Interplay of artistic, social and political forces in the development of Russian culture from the Kievan period to the present. Exclusive use of Russian language source materials. Prerequisite: RUS 312† or approval of instructor.

591 Seminar. (3) N
Topics may be selected from the following:

(a) Pre-19th Century Russian Literature
(b) 19th Century Russian Literature
(c) Russian Poetry to 1890
(d) Russian Poetry, 1890 to Present
(e) Russian Literary Criticism
(f) Soviet Socialist Realism
(g) Contemporary Soviet Authors

Special Courses: RUS 294, 394, 492, 493, 494, 499, 590. (See pages 35-36.)

SPANISH

SPA 101, 102 Elementary Spanish. (4-4) F, S, SS
Fundamentals of the language. Not open to students with credit in SPA 111. Four lectures, 1 hour laboratory.

107 Spanish for International Professions I. (8) F
Accelerated program alternative to SPA 101, 102 sequence. Functional approach to needs of international professions.

111 Fundamentals of Spanish. (4) F, S
Primarily for students with two years of high school Spanish who need review to enter second year study. Not open to students with credit in SPA 102. Four lectures, 1 hour laboratory.

201, 202 Intermediate Spanish. (4-4) F, S, SS
Continuation of fundamentals. Emphasis on the development of the skills of reading, listening comprehension, speaking and writing. Prerequisite: SPA 102† or 111. Four lectures, 1 hour laboratory.

203, 204 Intermediate Spanish for Bilinguals. (4-4) F, S
Designed to meet the needs of the Spanish-speaking student. May be taken in lieu of 201-202. Emphasis on composition, literature, conversation and review of grammar fundamentals. Prerequisite: SPA 102† or 111 or placement. Four lectures, 1 hour laboratory.

207 Spanish for International Professions II. (8) S
Continuation of SPA 107, alternative to SPA 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Prerequisite: SPA 107 or approval of instructor.

311, 312 Spanish Conversation. (3-3) F, S
Designed primarily for non-majors to promote facility in coherent and expressive diction in Spanish. Prerequisite: SPA 202† or equivalent.

313, 314 Spanish Conversation and Composition. (3-3) F, S, SS
Designed to develop skill and accuracy in spoken and written Spanish. Required of majors; to be taken in sequence. Prerequisite: SPA 202† or equivalent.

315, 316 Spanish Conversation and Composition for Bilinguals. (3-3) F, S
Designed to meet the needs of the Spanish-speaking student, May be taken in lieu of 313-314. Prerequisite: 202† or 204† or approval of instructor.

319 Business Correspondence and Communication. (3) S
Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: SPA 314† or 316† or approval of instructor.

325 Introduction to Hispanic Literature. (3) F, S
A critical approach to and analysis of literary types: poetry, drama, short story and novel. Required of all majors. Prerequisite: SPA 202† or 204†.

412 Advanced Conversation and Composition. (3) F, S
Oral and written Spanish communication skills, with particular attention given to developing fluency and facility. Required of majors. Prerequisite: SPA 314† or 316† or approval of instructor.

413 Advanced Spanish Grammar. (3) F
Intensive analysis of the Spanish language. Required of teaching majors. Prerequisite: SPA 314† or 316† or approval of instructor.

417 Spanish Phonetics and Phonology. (3) F '85
Introduction to the theory and practice of Spanish phonetics and phonology. Prerequisite: SPA 314†, or 316†.

420 Applied Spanish Linguistics. (3) S
Application of linguistic principles to the acquisition, analysis and teaching of Spanish. Prerequisite: FLA 400 or any other introductory linguistics course.

421 Spanish in the Southwest. (3) F '86
Analysis of Southwest spoken and written Spanish as compared to standard Spanish. Designed for students preparing for bilingual-bicultural work. Prerequisite: SPA 314† or 316† or approval of instructor.

424 Masterpieces of Hispanic Literature. (3) S
Selections from the literature of the Hispanic world and discussion of its cultural background. Required of but not limited to teaching majors. Prerequisite: SPA 325†.

425, 426 Spanish Literature. (3-3) F, S
Survey of Spanish literature from its beginning to the present. Prerequisite: SPA 325†.

427, 428 Spanish-American Literature. (3-3) F, S
Survey of major works, figures and movements from Colonial period to 1880 and from 1880 to present. Prerequisite: SPA 325†.

429 Mexican Literature. (3) N
Selected readings from pre-Colombian writers/poets (e.g. Macuilxóchitl) through the novel of the Revolution to the present. Prerequisite: SPA 325†.

434 Drama of the Golden Age. (3) S '87
Dramatic works of Lope de Vega, Calderón de la Barca and their contemporaries. Prerequisite: SPA 325†.

435 Cervantes - *Don Quijote.* (3) F '86
Don Quijote and the development of the novel. Prerequisite: SPA 325†.

436 Generation of 1898. (3) S '86
Works of Unamuno, Baroja, Azorín and their contemporaries, studied against the ideological background of the turn of century in Spain. Prerequisite: SPA 325†.

437 20th Century Spanish Poetry. (3) F '85
Major trends in Spanish poetry from Modernism to present. Prerequisite: SPA 325†.

454 19th Century Spanish American Narrative. (3) F '85
Principal works in the novel, short story, narrative fiction and narrative (Gauchesque) poetry. Prerequisite: SPA 325†.

455 Spanish American Modernism. (3) S '87
Principal works and figures of literary Modernism, 1880-1920; emphasis on international literary context of the movement. Prerequisite: SPA 325†.

456 20th Century Spanish American Fiction. (3) S '86
Major works and movements. Prerequisite: SPA 325†.

457 Contemporary Spanish American Poetry. (3) F '86
Major works and problems in contemporary poetry and poetics with emphasis on Paz, Parra, Cardenal and new poetry since 1960. Prerequisite: SPA 325†.

464 Mexican American Literature. (3) F
Representative literature in Spanish and English by Mexican Americans, emphasizing socio-cultural as well as literary values. Prerequisite: SPA 325†.

471 Civilization of the Spanish Southwest. (3) S
The political, intellectual, social, economic and artistic development of the Spanish-speaking people of the Southwest. Prerequisite: SPA 314† or 316† or approval of instructor.

472 Spanish-American Civilization. (3) F
Growth of the institutions and cultures of Spanish-American people. Prerequisite: SPA 314† or 316† or approval of instructor.

473 Spanish Civilization. (3) S
Political, intellectual, social, economic and artistic development of the Spanish nation from its origin to the present. Prerequisite: SPA 314† or 316† or approval of instructor.

485 Mexican American Short Story. (3) N
Critical study of contemporary short stories by Mexican American authors with emphasis on their Spanish-language writings. Prerequisite: SPA 325†, or approval of instructor.

486 Mexican American Novel. (3) N
Social and literary contexts of representative novelists, emphasizing their Spanish-language writings. Prerequisite: SPA 325†, or approval of instructor.

487 Mexican American Drama. (3) N
Representative dramatic works with emphasis on the history and development of this genre from its regional origins to the present. Prerequisite: SPA 325†, or approval of instructor.

500 Bibliography and Research Methods. (3) F
Required of all graduate students.

540 History of the Spanish Language. (3) S
Linguistic development of the Spanish language from the epoch of Vulgar Latin to the present day.

541 Spanish Language in America. (3) F '85
The major dialects of Spanish in the Americas and their historical, social and cultural development. Prerequisite: SPA 540 or approval of instructor.

542 Studies in the Spanish of the Southwest. (3) S '86
Examination of bilingualism and the social and regional dialects of Spanish in the Southwest. Prerequisite: FLA 400 or equivalent.

543 Structure of Spanish. (3) S '87
Analysis and discussion, within the framework of contemporary linguistic theories, of selected problems in Spanish morphophonology, syntax, and semantics. Prerequisite: FLA 400 or equivalent.

545 Concepts of Literary Criticism. (3) F '86
Aims and methods of modern literary scholarship. Discussion of major theories of literary analysis.

560 Medieval Spanish Literature. (3) N
Major figures and works of the Middle Ages in Spain.

561 Golden Age Spanish Prose Fiction. (3) N
Major figures and works of the 16th and 17th centuries, with emphasis on the picaresque novel.

562 Golden Age Spanish Poetry. (3) N;
Major figures and works of the 16th and 17th centuries, with emphasis on lyric poetry.

563 Spanish Romanticism. (3) N
Principal figures and works of the Spanish Romanticism, with emphasis on international literary context of the movement.

564 19th Century Spanish Prose Fiction. (3) N
Principal figures and works of Realism in the 19th century novel, with emphasis on Galdós.

565 20th Century Spanish Drama. (3) N
Principal figures and works of Spanish dramatic literature from the Generation of 1898 to the present.

566 Generation of 1927. (3) N
Major poets of the Generation of 1927, with emphasis on works of Lorca, Guillén, Salinas and Aleixandre.

567 Contemporary Spanish Novel. (3) N
Major works of post-Civil War Spanish fiction.

570 Indigenous Literatures of Spanish America. (3) N
The indigenous literary traditions with emphasis on Nahuatl, Mayan and Quechua literatures through readings in Spanish translations.

571 Colonial Spanish American Literature. (3) N
The major figures and works from Conquest to Independence.

572 Spanish American Drama. (3) N
Major contributions of Spanish American drama, with emphasis on contemporary dramatists.

573 Spanish American Essay. (3) N
Major works of the essay within the framework of intellectual history and literary movements.

574 Spanish American Vanguard Poetry. (3) N
Examination of poetic developments, 1920-1940, with emphasis on Huidobro, Vallejo, Neruda and the international context of their works.

575 Contemporary Spanish American Novel. (3) N;
Principal novels of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

576 Contemporary Spanish American Short Story. (3) N
Principal short stories of the *Nueva Narrativa Hispanoamericana*, within the context of contemporary theories of the narrative.

577 Regional Spanish American Literature. (3) N
The figures and works of major national (Peru, Argentina, Chile, Mexico), and regional (Caribbean) literatures. Topics offered on a rotating basis. May be repeated for different topics.

578 Novel of the Mexican Revolution. (3) N
Representative works and authors of this genre (Gúzman, Azuela, Urquizo, Muñoz, Romero), including related or peripheral off-shoots in indigenous novels.

579 18th Century Hispanic Literature. (3) N
The literature of the Enlightenment in Spain and Colonial Spanish America.

581 Latin American Popular Culture. (3) N
Studies in selected topics of Latin American popular culture, with emphasis on appropriate academic models for the critical analysis of these materials.

591 Seminar. (3) N
Spanish and Spanish American literary, cultural, and linguistic topics.

691 Figures and Works Seminar. (3) N
Topics may be selected from Spanish and Spanish American literatures.

Special Courses: SPA 294, 394, 298, 484, 492, 493, 494, 497, 498, 499, 580, 590, 592, 594, 598, 599, 692, 799. (See pages 35-36.) Prerequisite for SPA 590: approval of instructor, advisor and department chair. Secure forms in the Foreign Languages office.

Geography

PROFESSORS:
BRAZEL, COMEAUX, LOUNSBURY, MARCUS, McTAGGART, PARKER, WEIGEND

ASSOCIATE PROFESSORS:
GOBER (COB 338), ACKER, ALDRICH, COMEAUX, GRAF, MINGS, PASQUALETTI, SARGENT, ZONN

ASSISTANT PROFESSORS:
CARLETON, FROST, HENKEL

Departmental Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

Geography—Consists of 45 semester hours of credit. The required courses are GPH 111 or 411; 371 and 491; GCU 102, 375, and 495; an additional 3- or 4-hour course in GPH; an additional 3-hour course in GCU; and a 3-hour course in regional geography. A further 4-6 hours of electives must be chosen, for a total of 36 hours in geography. The remaining 9 hours are to be made up of electives from related fields of study, chosen in consultation with an advisor. At least 18 hours must be in upper division courses. In addition, the Bachelor of Arts degree carries a foreign language requirement (see Degree Requirements, page 53).

Area Studies Emphasis. (See Interdisciplinary Studies, pages 56-63.)—Consists of the Bachelor of Arts degree requirements in geography, along with additional require-

ments in the fields of Latin American Studies or Asian Studies.

For the *Latin American Studies Emphasis*, at least 30 upper division semester hours of the program must be in Latin American content courses, including 15 hours in geography (or in courses approved by the geography advisor) and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in Geography—Latin American Studies.

For the *Asian Studies Emphasis*, the program requires 30 semester hours of wholly Asian content courses, selected from the list drawn up by the Center for Asian Studies. Also required is knowledge of an Asian language; this is deemed to be fulfilled by 16 semester hours of credit or the equivalent in Chinese, Japanese, or any other Asian language approved by the Center in respect of any individual program.

Special Emphasis Programs

Two special emphasis programs, Urban Studies and Meteorology-Climatology, are available within the Bachelor of Science degree curriculum in geography.

Urban Studies Emphasis—The required courses are GPH 111 or 411; 371 and 491; GCU 102, 359 or 360, 361, 357, 375, 444 and 495. In addition, students must select one 3-hour regional course, and one from the following list of options: GCU 351, 352, 401†, 442†, 453, 461, and GPH 481. If GPH 481 is not selected, a further 3-hour course in GPH is required. At least 9 of the 15 hours in fields related to geography must be in urban-oriented course work.

Meteorology-Climatology Emphasis—The required courses are GCU 102, 375 or 495, GPH 212, 213, 214, 215, 310, 311, 371, 412, 413, 491. Students must also choose one regional course and any other 3-hour course in GCU. Also required are the following related courses: MAT 270†, 271, 272 (or MAT 290†, 291), PHY 111†, 112, 113, and 114. Completion of this program satisfies the criteria for employment with the National Weather Service.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Geography—Consists of 45 semester hours of credit, of which a minimum of 30 must be in geography and 15 in a related teaching field or fields. Departmental minor teaching field requirements (Elementary and Secondary Education) consists of a minimum of 24 semester hours of credit. Courses GPH 111 or 411 and GCU 121 are required. The remaining hours are to be selected in consultation with an advisor.

Departmental Graduate Programs

The Department of Geography offers programs leading to the Master of Arts and Doctor of Philosophy degrees. Consult the *Graduate College Catalog* for requirements.

CULTURAL GEOGRAPHY

Courses which may be applied toward the General Studies requirement in social and behavioral sciences.

GCU 102 Introduction to Human Geography. (3) F, S
Systematic study of human use of the earth. Spatial organization of economic, social, political and perceptual environments.

121 World Geography. (4) F, S
Description and analysis of areal variations in social, economic and political phenomena in major world regions.

141 Introduction to Economic Geography. (3) F, S
Production, distribution and consumption of various types of commodities of the world and relationships to the activities of man.

209 Introduction to the Study of Energy. (3) F
An integrative, non-technical introduction to many aspects of energy, including: power plants, resources, life-styles, environment, geography, economics, policy. Field trip.

253 Introduction to Cultural and Historical Geography. (3) F, S
Cultural patterns, including such phenomena as language, religion and various aspects of material culture. Origins and diffusion and division of the world into cultural areas.

322 Geography of Anglo-America. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in the United States and Canada.

323 Geography of Latin America. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in South, Middle and Caribbean America.

325 Geography of Europe. (3) S
Spatial distribution of relevant physical, economic and cultural phenomena in Europe. Recommended for social studies teachers and students of European history.

326 Geography of Asia. (3) S
Spatial distribution of relevant physical, economic and cultural phenomena in Asia, excluding the U.S.S.R.

327 Geography of Africa. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in Africa.

332 Geography of Australia and Oceania. (3) A
Spatial distribution of relevant physical, economic and cultural phenomena in Australia, New Zealand and Pacific Islands.

350 The Geography of World Crises. (3) F
Contemporary world crises viewed from a perspective of geographic concepts and techniques.

351 Population Geography. (3) S
Demographic patterns; spatial, temporal and structural investigation of the relationship of demographic variables to cultural, economic and environmental factors.

352 Political Geography. (3) S
Relationship between the socio-physical environment and the state.

357 Social Geography. (3) F
Environmental perception of individuals and groups. The spatial aspect of social and physical environments is stressed.

359, 360 Cities of the World. (3-3) A
Historical development and evolution of the earth's urban patterns; internal structure of selected world cities. First semester: Middle East, China and Japan, Southeast Asia, Europe; Second semester: Latin America, Anglo America, Sub-Saharan Africa, Australasia.

361 Urban Geography. (3) F, S
External spatial relations of cities, internal city structure and spatial aspects of urban problems in various parts of the world, particularly in the United States.

364 Geography of Energy. (3) F
Production, transportation and consumption of energy, emphasizing the electric power industry and its environmental problems.

375 Introduction to Geographic Research Methods. (3) S
Scientific techniques used in geographic research. Prerequisite: approval of instructor.

401 Topics in Cultural, Economic and Political Geography. (1-3) F, S, SS
Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: approval of instructor.

421, 423, 424, 426, 428, 431, 432: Courses concern spatial distribution of relevant physical, economic and cultural phenomena in the area designated.

421 Geography of Arizona and Southwestern United States. (3) F, S

423 Geography of South America. (3) F
Prerequisite: GCU 323 or approval of instructor.

424 Geography of Middle America. (3) S
Central America. Prerequisite: GCU 323 or approval of instructor.

426 Geography of the Soviet Union. (3) S
Prerequisite: GCU 121 or approval of instructor.

428 Geography of Middle East. (3) N
The Near East, emphasizing current political and economic developments. Prerequisite: GCU 121 or approval of instructor.

431 Geography of the Far East. (3) N
Japan, China, Korea, excluding the U.S.S.R. Prerequisite: GCU 326 or approval of instructor.

432 Geography of Sub-Saharan Africa. (3) N
A regional analysis, emphasizing south of the Sahara. Prerequisite: GCU 327 or approval of instructor.

441 Economic Geography. (3) F, S
Spatial distribution of primary, secondary and tertiary economic and production activities. Prerequisite: GCU 141 or approval of instructor.

442 Geography of Transportation. (3) N
Geographic analysis of world trade routes and transportational systems. Prerequisite: GCU 141 or 441.

444 Applied Urban Geography. (3) N
Designed to prepare the student for employment in planning agencies. Includes application of urban geographic principles to present day planning problems. Prerequisite: GCU 361.

453 Recreational Geography. (3) S
Examination of problems surrounding the organization and use of space for recreation. Introducing geographic field survey methods of data collection and analysis. Saturday field trips may be required.

455 Historical Geography of Anglo-America. (3) N
Changing geography of the United States and Canada from pre-Columbian times to about 1900. Emphasis on evolving economic patterns. Recommended for social studies teachers and students of American history.

461 Geographic Applications of Urban and Regional Planning. (3) N
Philosophy of the planning concept, nature and function of planning commissions and development of comprehensive plans. Prerequisites: GCU 361 or 444† or approval of instructor.

462 Geography of Food and Famine. (3) S
Spatial distribution of relevant physical, economic and cultural factors influencing production and consumption of foodstuffs. Field trips may be required.

495 Quantitative Methods in Geography. (3) A
Statistical techniques applied to the analysis of spatial distributions and relationships. Introduction to models and theory in geography. Prerequisite: MAT 106 or approval of instructor.

501 Geography Colloquium. (1) N
New trends in the discipline; current research being conducted by geography students, faculty and invited guests. May be repeated for credit.

526 Spatial Land Use Analysis. (3) S
Determination, classification, and analysis of spatial variations in land use patterns. Examination of the processes affecting land use change. Prerequisite: 15 hours of geography or approval of instructor.

529 Contemporary Geographic Thought. (3) S
Comparative evaluation of current philosophy concerning the nature and trends of geography. Prerequisites: 15 hours of geography and approval of instructor.

585 Advanced Research Methods in Geography. (3) F
Specialized research techniques and methodologies in economic, political or cultural geography.

591 Seminar. (1-3) F, S, SS
Selected topics in economic, political or cultural geography. Field trips may be required.

596 History of Geographic Thought. (3) N
Development of geographic thought from Herodotus and Strabo to Humboldt and Ritter.

Special Courses: GCU 484, 492, 494, 497, 498, 499, 500, 580, 584, 590, 592, 594, 598, 599, 600, 680, 683, 684, 690, 691, 692, 700, 780, 784, 790, 791, 792, 799. (See pages 35-36.)

PHYSICAL GEOGRAPHY

Courses which may be applied toward the General Studies requirement in sciences and mathematics.

GPH 111 Introduction to Physical Geography. (4) F, S
Spatial and functional relationships among climates, landforms, soils, water and plants. Three lectures, 3 hours laboratory. Field trips are required.

210 Physical Environment. (3) F
Principles of physical geography relating to environmental problems pertinent to contemporary society. Pollution, maladjusted land use, resource exploitation.

211 Introduction to Landforms. (3) S
Geographic characteristics of major types of landforms, stressing areal association by use of maps. Field trips are required. Prerequisite: GPH 111. Two lectures, 3 hours laboratory.

212, 213 Introduction to Meteorology I, II. (3-3) A
Atmospheric processes and elements. General and local circulation, heat exchange and atmospheric moisture. Students whose curricula require a laboratory course must also register for GPH 214†, 215†. Prerequisite: GPH 111 or approval of instructor.

214, 215 Introductory Meteorology Laboratory. (1-1) A
Introduction to meteorological observations and measurement. Numerical and cartographic interpretation of weather data. May be taken concurrently with, or subsequent to, GPH 212†, 213†, respectively. Three hours laboratory.

271 Maps and Map Reading. (3) F
Techniques of interpretation of the many types of maps, map projections and history of mapping. Field trips are required. Prerequisite: GPH 111.

310, 311 Synoptic Meteorology I, II. (4-4) F '85; S '86
Diagnostic techniques and synoptic forecasting. Includes practical operation of field stations and techniques of weather analysis. Field trips are required. Prerequisite: GPH 212†, 213† or approval of instructor. Three lectures, 3 hours laboratory.

317 Marine Geography. (3) F, S
Spatial analysis of the physical characteristics and potential economic and cultural resources of the oceans. Prerequisite: GPH 111 or 411, or approval of instructor.

371 Cartography. (3) F, S
Basic map drafting, grid compilation, simple design and use of cartographic instruments. Field trips are required. Prerequisites: GPH 111 and 271† or approval of instructor. Six hours laboratory.

372 Air Photo Interpretation. (3) S
Aerial photographs as a means of determining topography, vegetation and culture; scale, use of index, vertical and oblique photographs and stereoscopes. Prerequisites: GPH 111, 211†.

381 Geography of Natural Resources. (3) S
Nature and distribution of natural resources and the problems and principles associated with their use.

401 Topics in Physical Geography. (1-3) F, S, SS
Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: approval of instructor.

405 Energy and Environment. (3) S
Sources, regulatory and technical controls, distribution, and consequences of the supply and human use of energy. Prerequisites: students are expected to have taken courses in the physical and/or life sciences as preparation; or approval of instructor.

411 Physical Geography. (3) F, S
Introduction to physiography and the physical elements of the environment. Open only to students who have not taken GPH 111. Field trips are required.

412 Physical Climatology. (3) S
Physical processes of the earth-atmosphere system on regional and global scales; concepts and analysis of energy, momentum and mass balances. Field work required. Prerequisite: GPH 212†-213† or 310†, or approval of instructor.

413 Meteorological Instruments and Measurement. (3) A
Design and operation of ground-base and aerological weather measurement systems. Collection, reduction, storage, retrieval and analysis of data. Field trips are required. Prerequisite: GPH 212†, 213†, or approval of instructor.

414 Climatic Analysis. (3) F
Processes that produce variations in climate over time and space. Includes changes in climate produced by human and natural forces and involves the analysis of climatic data to identify temporal and spatial variations. Prerequisite: GPH 212† or approval of instructor.

433 Alpine and Arctic Environments. (3) F
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. Field trips are required. Prerequisite: GPH 111 or approval of instructor.

481 Environmental Geography. (3) S
Problems of environmental quality including uses of spatial analysis, research design and field work in urban and rural systems. Field trips are required. Prerequisite: approval of instructor.

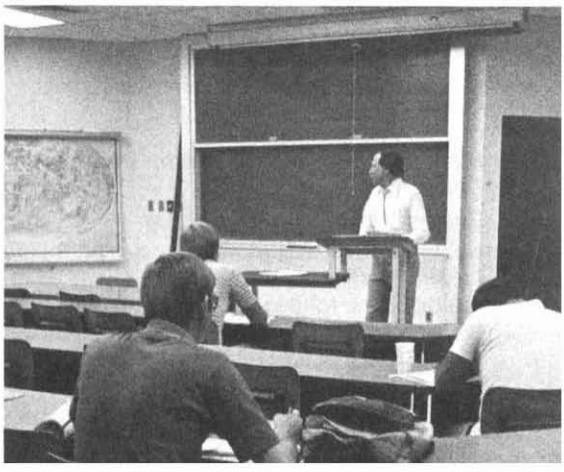
491 Geographic Field Methods. (6) SS
Field techniques including use of aerial photos, large-scale maps, fractional code system of mapping; urban and rural field analysis to be done off campus; travel fees required. Prerequisite: approval of instructor.

571 Computer Mapping and Graphics. (3) F
Utilization of the digital computer in analysis and mapping of geographic data. Includes plotting, surficial display, compositing and graphics. Field trips are required. Prerequisites: GPH 371† and approval of instructor.

575 Geographic Applications of Remote Sensing. (3) S
Use of imaging and non-imaging methods of remote acquisition of data, including satellite sensors, airborne radar, multiband scanning, conventional photographic sensors and ground based equipment. Field trips are required. Prerequisites: GPH 372†, GCU 585 or GPH 491†.

591 Seminar. (1-3) F, S
Selected topics in physical geography. Field trips may be required.

Special Courses: GPH 294, 484, 492, 494, 497, 498, 499, 500, 580, 584, 590, 592, 598, 599, 600, 680, 683, 684, 690, 691, 692, 700, 780, 784, 790, 791, 792, 799.
(See pages 35-36.)



completed GLG 100 or 101 or their equivalents. Possible field trips.

481 Geochemistry. (3) F
Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere. Prerequisites: CHM 341† or 441† or GLG 321†. (Same as CHM 481.)

485 Meteorites and Cosmochemistry. (3) N
Chemistry of meteorites and their relationship to the origin of the earth, solar system and universe. Prerequisite: GLG 481† or 482†. (Same as CHM 485.)

490 Topics in Geology. (1-3) F, S, SS
Special topics in following fields: mineralogy, petrology, economic geology, geochemistry, petroleum geology, regional geology, geomorphology, geophysics, planetary geology, paleontology, stratigraphy, sedimentology, volcanology, field geology and structural geology. Prerequisite: approval of instructor. May be repeated for credit.

501 Geology of Arizona. (3) F, S
Basic and historical geology, fossils, mining, energy resources, environmental problems, landscape development, and meteorites, cast in examples from Arizona. Three lectures. Research paper required.

502 Geology Colloquium. (1) F, S
Presentation of recent research by geology students, faculty, and invited guests. May be repeated for a total of 4 credits. Prerequisite: two courses in the department or approval of instructor.

504 Geology of the Grand Canyon. (2) S
Review of the discovery, history, origin and geology of the Grand Canyon of the Colorado River in Arizona. Six day field trip down the river (first six days after commencement in May) required at student's expense. Field research and term paper on trip also required.

505 Geology of Arizona Laboratory. (1) F, S
Laboratory for GLG 501, 2 hours. Weekend field trip to the Grand Canyon.

510 Advanced Structural Geology. (3) N
Mechanics of rock deformation, emphasizing relationship between field observation, theory and experiment. Stress, strain, simple constitutive relationships, failure criteria, and the basis of continuum methods. Prerequisites: GLG 310†, 424† or approval of instructor. Possible field trips.

523 Advanced Mineralogy-Crystallography. (3) S
Crystallography, principles of X-ray and electron diffraction, defects in crystals, electron microscopy of minerals. Three lectures. Prerequisites: GLG 321† or CHM 441 or equivalent.

524 Advanced Igneous Petrology. (3) N
Theoretical and practical aspects of the genesis of igneous rocks. Study of selected suites. Modern laboratory techniques. Prerequisite: GLG 424†. Two lectures, 3 hours laboratory. Possible weekend field trips.

525 Advanced Metamorphic Petrology. (3) N
Theoretical and laboratory study of metamorphic rocks. Processes of contact and regional metamorphism. Advanced methods and instrumentations. Prerequisite: GLG 424†. Two lectures, 3 hours laboratory. Possible weekend field trips.

561 Glacial Geology. (3) N
Properties, distribution and origin of glacial deposits, including principles of their stratigraphy and correlation. Environmental geology problems in glaciated regions. Prerequisite: GLG 362†. Two lectures, 3 hours laboratory. Some field trips during laboratory; possible weekend field trips.

562 Quaternary Geology. (3) N
Geology of the Quaternary Period in both glaciated and unglaciated areas. Stratigraphy, correlation and environmental application of Quaternary deposits. Special reference to the Southwest. Prerequisite: GLG 362†, or approval of instructor. Two lectures, 3 hours laboratory. Some field trips during laboratory; possible weekend field trips.

581 Isotope Geochemistry. (3) N
Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Prerequisite: approval of instructor. (Same as CHM 581.)

582 Physical Geochemistry. (3) N
Application of thermodynamic and kinetic principles to geochemical processes. Prerequisite: GLG 321† or CHM 341 or 417† or 441†. (Same as CHM 582.)

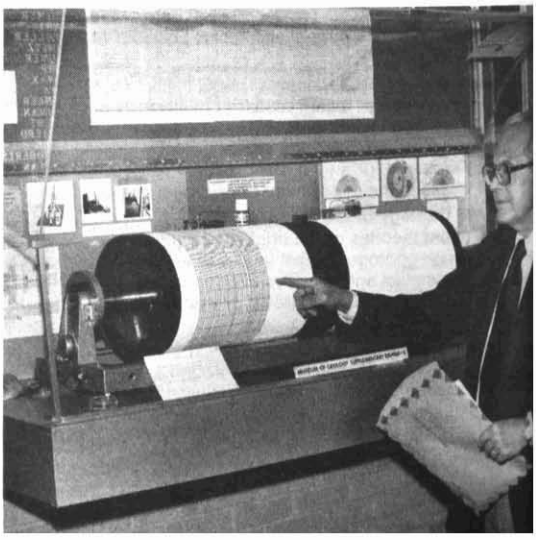
583 Phase Equilibria and Geochemical Systems. (3) N
Natural reactions at high temperatures and pressures; silicate, sulfide and oxide equilibria. Prerequisite: approval of instructor. (Same as CHM 583.)

591 Seminar. (1-3) F, S, SS
Topics may be selected from the following:

(a) Igneous, Metamorphic, and Sedimentary Petrology
(b) Pleistocene Environment
(c) Advanced Geophysics
(d) Structural Geology
(e) Paleoecology
(f) Advanced Stratigraphy
(g) Mineralogy and Crystallography
(h) Mineral Deposits
(i) Geochemistry
(j) Physical and Chemical Sedimentology
(k) Biostratigraphy
(l) Environmental Geology
(m) Planetary Geology
(n) Stratigraphic Micropaleontology
(o) Volcanology

See related courses: ASB 541† Archaeological Pollen Analysis; BOT 490† Paleobotany.

Special Courses: GLG 484, 492, 493, 494, 498, 499, 590, 592, 593, 598, 599, 690, 691, 692, 783, 790, 791, 792, 799. (See pages 35-36.)



Health and Physical Education

PROFESSORS:
(PEBW M-201), CORBIN, CORDER, KRAHENBUHL, LANDERS, MILLER, ODENKIRK, OLSEN, OSTERHOUDT, PANGRAZI, PITTMAN, SKINNER, STONE, TOOHEY, WELLS

ASSOCIATE PROFESSORS:
BRYANT, BURKETT, DARST, DEZELSKY, PIKE, SHIRREFFS

ASSISTANT PROFESSORS:
GRIER, MARTIN, WILSON, WULK

INSTRUCTOR:
BISHOP

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Health Science (Community Health Emphasis) — Consists of 62-64 semester hours of credit of which 42 must be in the major. Courses HES 100, 340, 360, 361†, 382, 480, 482, 483 and 498 are required. Related fields include ZOL 201, 202; and one course in chemistry. Twelve hours of health science electives and 12 hours of related field electives are selected by the student in consultation with a faculty advisor. (See Degree Requirements, page 53).

Physical Education—Consists of 38 semester hours of credit of which 28 must be in the major field. Courses ZOL 201, 202, and PED 170, 335†, 340†, 345†, 450 and selected physical education activity courses are required. At least 18 semester hours must be in upper division courses and the entire program must be planned in consultation with the student's advisor. Concentration within the program of studies may be directed toward such nonteaching options as exercise science, sports administration, or sport and the media. (See Degree Requirements, page 53.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Health Science (School Health Emphasis)—Consists of 38 semester hours of credit. Courses HES 100, 340, 360, 361†, 382, and 480 are required. Related fields include ZOL 201 and 202, and one course in chemistry. Twelve hours of health science electives and 8 hours of related field electives are selected by the student in consultation with a faculty advisor. At least 18 semester hours must be in upper division courses.

Physical Education—All majors are required to complete 10 credits of professionally oriented activities as prescribed by the department. Also required are 37 credits in the following theory courses: PED 170, 335†, 340†, 345†, 361, 376, 382, 450, 480, 483, DAN 367 and EED 313. Additionally 300 hours of field experience in sports-related leadership roles must be completed prior to student teaching (150 hours for transfer students). A 2.50 GPA is required for entrance to upper division major courses and SED 433† student teaching. A minimum of 9 credits of student teaching is required, which includes both elementary and secondary school teaching experiences.

Departmental Minor Teaching Field Requirements (Secondary Education)

Health Science—Consists of 24 semester hours of credit. Courses HES 100, 340, 360, 361†, 382, and 480 are required. An additional 6 hours of health science electives are to be selected by the student in consultation with a health science advisor.

Coaching of Athletics (Men and Women)—Consists of 32 semester hours of credit. Courses ZOL 201, 202; PED 335†, 340†, 346, 383† and 486† are required; plus 9 hours from PED 291† and electives selected by the student in consultation with an advisor.

Athletic Trainer's Certificate (Men and Women)—Consists of 41 hours of credit. Courses PSY 212; PGS 100; ZOL 201, 202; HES 100; FON 141; PED 270†, 335, 340, 382, 383†, 485 and PED 486 are required; plus electives selected by the student in consultation with an advisor. Note: Six (6) semester hours of credit or two years' equivalent work of 600 clock hours of internship.

Departmental Graduate Programs

The Department of Health and Physical Education offers programs leading to the Master of Science degree in Physical Education, Master of Education—Secondary Education (Health Science), Master of Education—Secondary Education (Physical Education), Education Specialist—Secondary Education (Physical Education),

Doctor of Philosophy in Exercise Science, Doctor of Education—Secondary Education (Physical Education), and Doctor of Philosophy—Secondary Education (Physical Education). Consult the *Graduate College Catalog* for requirements.

HEALTH SCIENCE

HES 100 Personal Health. (3) F, S, SS
Human struggle for achieving harmony between the slowly-changing inner environment and the rapidly-changing outer environment. Some sections may be offered with discussion groups. Consult schedule of classes.

304 Human Sexual and Reproductive Health. (3) S
Issues of curriculum development and program planning. Designed to prepare professionals to instruct younger persons in these areas.

305 Substance Abuse. (3) F
General properties, principles of action, and behavioral effects of psychoactive drugs. Focuses on how substances affect health of humans.

306 Consumer Health. (3) F, S
Examination of consumer behavior in the health marketplace. Emphasis on systems of healing, health insurance, quackery and product safety.

340 School Health. (3) F, S, SS
Basic plan of the school health program; health services, health instruction and school health environment. Analysis of school health problems.

360 Fundamentals of Disease Control. (3) F, S, SS
Epidemiology of communicable and non-communicable diseases. Disease prevention and control. Primarily for prospective health teachers and public health educators.

361 Foundations of Health Science Education. (3) F, S, SS
Analysis of research in various disciplines which contribute to health education. Primarily for prospective health teachers and public health educators. Prerequisites: HES 100 and 382; 6 semester hours in social and behavioral sciences.

382 Introduction to Public Health. (3) F, S, SS
Public and community health is examined including governmental, voluntary, and community agency activities which promote health among populations.

400 Health and Aging. (3) F
Issues of health, illness and disease among the elderly. Introduction to basic aging and health concerns of older people. Prerequisites: Senior standing, 9 semester hours of health or biological sciences, or approval of instructor.

401 Patient Education. (3) S
Issues in patient behavior, the illness role, learning theory and the educational process as it relates to medical care settings. Prerequisites: Senior standing, SOC 101 and PGS 100 (or equivalent), 9 semester hours of health science or approval of instructor.

470 Environment and Public Health. (3) F, S
Principles of environmental health, involving management of ecosystems and their relationship to public and community health.

480 Methods of Teaching Health. (3) F, S
Techniques and materials for health instruction. Health Education majors and minors only. Prerequisites: HES 100, 360, 361 and 382.

482 Advanced Public Health. (3) F, S
Theory and concepts of public health practice. Program planning, implementation and evaluation applied to a diversity of public health problems. Prerequisites: HES 340 and 480.

483 Supervised Field Training. (3-6) F, S.
Opportunities to observe and work in public and voluntary agencies, either in preparation for beginning-level employment or better understanding of the interrelationships in community health programs. Prerequisite: 24 hours of required health science courses. May be repeated for a total of 9 hours.

501 International Health. (3) F
A systematic comparison of the factors that affect public health on a global basis.

502 Health Problems of the Southwest. (3) S
Coccidioidomycosis, allergies, vector infestations, diabetes among the Pima Indians, arthritis, dysenteries, rabies, airborne viruses, histoplasmosis, sanitation, air and water pollution, pesticide contamination of food products.

504 Education for Human Sexuality. (3) F
Current concepts of human sexuality are explored and applied to curriculum development and program planning in health education.

505 Drug Dependency: Perspectives and Approaches. (3) S
Classification of mood-modifying substances in terms of effects. Motivational and social forces contributing to the dynamics of the problem; control and treatment.

554 Behavioral Aspects of Health Education. (3) F
The nature of health and disease from a cultural, social, and psychological perspective. Strategies for attaining health promotive behaviors.

560 Curriculum Construction in Health Education. (3) N
Problems of curriculum construction with respect to acquisition of materials, establishment of basic curriculum philosophies, application of education principles, and sequence of course content.

Special Courses: HES 484, 494, 498, 499, 590, 591, 592, 593, 594, 598, 599. (See pages 35-36.)

Students who complete satisfactorily selected HES 494 courses or HES 470 are eligible to qualify for a certificate of accomplishment from the Center for Disease Control, U.S. Department of Health and Human Services.

PHYSICAL EDUCATION

A $5.00 towel and locker fee is required each semester by students using towel and locker facilities for physical education classes and intramural activities.

Physical Education Activity classes (PED 105, 205, 305, 310) may not be taken for audit.

PED 105 Physical Education Activity. (1) F, S, SS
Beginning instruction in adapted physical activities and a variety of sports: golf, scuba, karate, judo, handball, equitation, tennis, swimming, weight training, gymnastics, and other activities. Three hours a week. May be repeated for credit.

110 Professional Activities, Individual and Team Sports. (1-2) F, S
Skills, strategies and knowledge of selected physical activities. One lecture, one laboratory. Physical Education majors only. May be repeated for credit.

170 Introduction to Physical Education. (3) F, S, SS
Orientation to and exploration of the field of physical education, to be taken in the freshman year. Required of students majoring in physical education.

175 Occupational and Physical Therapy. (2) S
Backgrounds, purposes and functions of the professions of physical therapy and occupational therapy;

their relationships to health professions and community agencies.

183 Introduction to Athletic Training. (3) F
The role and responsibility of the athletic trainer, daily training room procedures and basic taping and wrapping skills.

205 Physical Education Activity. (1) F, S, SS
Intermediate levels. Continuation of PED 105. Three hours a week. May be repeated for credit.

270 Instructorship in Standard First Aid. (2) F, S
For individuals seeking the Standard First Aid Certificate, leading to qualification as a first aid instructor. Prerequisite: must be 18 years of age.

283 Prevention and Care of Athletic Injuries. (3) F
Taping, injury recognition, emergency care and observation procedures in athletic training. Prerequisites: ZOL 201 and 202†.

290 Sports Officiating. (3) F, S
Rules and mechanics of officiating used in football, basketball, baseball and track and field.

291 Theory of Coaching. (2) F, S
Theory of coaching competitive sports. Each class meets four hours per week. Physical education majors and coaching minors, or approval of area chair.

305 Physical Education Activity. (1) F, S
Advanced levels. Continuation of PED 205. Includes Red Cross Senior Life Saving, Red Cross Water Safety Instructorship (Prerequisite: Current Senior Red Cross Life Saving Certificate), and other aquatic activities. Three hours a week. May be repeated for credit.

310 Collegiate Sports. (1) F, S
Credit may be given for participation in competitive sports. For men and women. May be repeated for a total of 4 credits. Time arranged. Y grade only.

325 Fitness for Life. (3) F, S
Physical fitness and benefits of exercise with emphasis on self evaluation and personalized program planning for a lifetime.

335 Biomechanics. (3) F, S, SS
Kinematics and dynamics applied to human movement. Development of biomechanical concepts for application in analysis and evaluation of neuromuscular skills. Prerequisite: ZOL 201.

340 Physiology of Exercise. (3) F, S, SS
Effects of the various types of exercise upon body structure and function. Prerequisite: ZOL 202†.

345 Motor Development and Learning. (3) F, S, SS
Development of perceptual-motor behavior from infancy through adulthood. Acquisition of neuromuscular skills is examined with references to biological, psychological, and social determinants. Prerequisites: ZOL 201 and 202†.

346 Psychology of Coaching. (3) S, SS
Principles of learning applied to coaching sports. Psychological and social problems of coaching.

361 Physical Education in the Secondary School. (3) F, S, SS
Current trends and theories, such as elective programs, coed classes, legal issues, contract teaching, curriculum and administration.

376 Physical Education for the Elementary School. (3) F, S, SS
Scope and values of physical education and movement education in the elementary school. Methods, materials and practice in teaching activities for primary, intermediate and upper grades.

382 Physical Education for the Atypical Student. (3) F, S, SS
Handicapping conditions found among students and adaptation of exercises and activities to individual needs. Open to all students. Prerequisite: PED 335† or instructor's approval.

383 Advanced Techniques and Evaluation of Athletic Injuries. (3) S
Evaluation of athletic injuries, recognition of the importance of physical exams. Conditioning programs and disqualifying factors in athletics. Prerequisite: PED 283. Designed for students seeking NATA certification.

450 History of Physical Education. (3) F, S, SS
Development of physical education from ancient primitive to twentieth century civilization.

451 Philosophy of Physical Education. (3) F, S, SS General notions of reality, knowledge, and value as related to physical education

480 Methods of Teaching Physical Education. (2,2) F, S
Methods of instruction, organization and presentation of appropriate content in elementary and secondary physical education. Concurrent with student teaching and/or permission of instructor.

483 Evaluation in Physical Education. (3) F, S, SS
Analysis and construction of tests. Analysis of data and interpretation of measurement in physical education programs.

485 Rehabilitation of Athletic Injuries. (3) S
Application of principles and practices regarding the use of modalities and rehabilitation techniques in the athletic training room. Prerequisite: PED 383. Designed for students seeking NATA certification.

486 Coaching/Athletic Training Internship. (1-6) F, S
Relationship of theory of coaching athletics and/or athletic training techniques to practical application of coaching and/or athletic training techniques. Prerequisite: approval by discipline chair. Y grade only.

501 Research Statistics. (3) S
Statistical procedures; sampling techniques; hypothesis testing, and experimental designs as they relate to studies reported in research publications.

505 Research Laboratory. (3) F, S
Advanced research techniques in use and calibration of laboratory equipment utilized in cinematographic analysis, cardiorespiratory testing and motor learning experimentation.

510 Biomechanics. (3) S, SS
Statics, dynamics, strength of materials, and fluid dynamics as applied to human movement. Current research in biomechanics and techniques of research.

520 Psychology of Exercise and Sport. (3) F, SS
Principles derived from motor learning, motor development, and sport psychology applied to coaches' and athletes' behavior in competitive sport.

521 Motor Learning and Development. (3) F, S, SS
Theories and principles underlying motor learning, performance, and development. Role of visual and kinesthetic perception, and general and specific abilities in motor learning and performance.

530 Exercise Physiology. (3) F, SS
Immediate and long-term adaptations to exercise with special reference to training and the role of exercise in cardiovascular health.

534 Athletic Conditioning. (3) S, SS
Bases of sports conditioning, including: aerobic and anaerobic power, strength, flexibility, analysis of conditioning components for sports.

536 Fitness Program Development. (3) F
Planning, organization, and administration of fitness programs. Exercise testing and prescription. Programs for special groups.

542 Environmental Aspects of Human Performance. (3) S
Mechanisms of physiological response of healthy human beings to desert, arctic, mountain and undersea environments, with emphasis on the effect of environmental stresses upon exercise performance.

550 Historical Bases of Physical Education. *(3)* F, S, SS
Golden Age of Greece, Renaissance and modern Europe. Cultural, economic and educational forces which influenced the development of physical education, dance, and athletics in the United States.

555 Sport and the American Society. (3) F, S, SS
Impact of sports upon the American culture, with focus on competition, economics, myths, minorities, and the Olympic syndrome.

560 Theory of Administration. (3) F, S, SS
Administrative philosophies, development of concepts related to processes of administration, types of administrative behavior, tasks and responsibilities of the administrator, evaluation of the effectiveness of administration.

561 Administration of Athletics. (3) F, SS
Managing an athletic program; financing, budget policies, staging and promotion of athletic contests, schedules, travel insurance, and current athletic trends.

562 Facility Development. (3) F, S
Principles, standards, personnel, designs, and equipment utilized in the planning, construction, and maintenance of *indoor/outdoor facilities.*

565 Improving Sport Skills. (3) N
Factors in successful motor performance in skills used in individual, dual, and team sports.

570 Adapted Physical Education. (3) S, SS
Contemporary adapted, developmental, remedial and corrective physical education programs; understanding of principles, problems, and recent developments in this area.

572 Trends and Issues in Physical Education. (3) F, S, SS
Literature, research, and practices in contemporary physical education, including finances, Title IX, teaching and coaching philosophies, school organization, and non-teaching physical education programs.

573 Curriculum Construction in Physical Education. *(3)* F, S, SS
Application of principles, practices, and functional philosophies of curriculum making in physical education. Prerequisite: major in physical education or teaching experience.

574 Behavioral Analysis in Sport and Physical Education. (3) SS, N
The application of behavioral principles, practices, philosophies and research to teaching physical education and coaching athletics.

575 Teaching Lifetime Fitness. (3) S, SS
Organizing and implementing physical fitness programs in the schools with emphasis on individual problem solving.

576 Physical Education for Elementary School Children. (3) S, SS
Current practices and research pertaining to elementary school physical education programs.

577 Movement Experiences for Pre-School Children. (3) SS, N
Movement activities for pre-schoolers based on the needs and characteristics of young children.

620 Psychomotor Development. (3) S, SS
Analysis and discussion of current research results including theoretical models for conducting research. Prerequisite: PED 520.

621 Motor Learning. Alternate years. (3) F
Role of general and specific abilities, as well as various perceptual components, underlying motor learning and performance. Prerequisite: PED 520.

622 Sport Psychology. (3) S, SS
Theories and principles underlying the athlete's behavior in competitive sport, with emphasis on personality, motivation, and team dynamics. Prerequisite: PED 520.

Special Courses: PED 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 680, 683, 684, 690, 691, 692, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

History

PROFESSORS:
GIFFIN (SS 204), BARLOW, BURG, DANNENFELDT, HUBBARD, KLEINFELD, LOEWENBERG, MULHOLLAN, PAULSEN, TAMBS, TRENNERT, WARNICKE, YOUNG

ASSOCIATE PROFESSORS:
ADELSON, BATALDEN, FULLINWIDER, KAHN, KEARNEY, LUCKINGHAM, MacKINNON, PHILLIPS, ROSALES, ROTHSCHILD, R. D. SMITH, STOWE, TILLMAN, WOOTTEN

ASSISTANT PROFESSORS:
CARROLL, DELLHEIM, FUCHS, GRATTON, JACKSON, L. C. SMITH, WEINER

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

History—Consists of 45 semester hours of credit of which 30 must be in history and 15 in related fields to be approved by the advisor in consultation with the student. Either HIS 498 (Pro-Seminar) or HIS 499 (Honors Thesis) is required. At least 18 hours in history courses and six hours in the related fields must be in upper division courses. At least six hours in history must be taken in each of two of the following areas: U.S., Latin American, British, Asian, European. A minimum grade point average of 2.25 in the 30 hours of history courses is required. (See Foreign Language Requirement, page 53.)

Latin American Studies Emphasis—(See Interdisciplinary Studies, page 82.) Consists of the Bachelor of Arts degree requirements in history. At least 30 upper division semes-

ter hours of the total program must be in Latin American content courses, including 15 hours in history and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required and a reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a bachelor's degree with a major in History—Latin American Studies Emphasis.

Asian Studies Emphasis—(See Interdisciplinary Studies, page 57.) Consists of the Bachelor of Arts degree requirements in history, with the language requirement being fulfilled with an Asian language. Thirty semester hours of the total degree program must consist of Asian area courses selected with the approval of the departmental advisor. Lower division language courses may not be counted within the 30-hour requirement. Completion of this program is recognized by a Bachelor of Arts degree with a major in History—Asian Studies Emphasis.

Bachelor of Science Degree Curriculum

History—Consists of 60 semester hours of credit, of which 42 (including HIS 481 and 482) must be in history and 18 in closely related fields and quantitative studies, as approved by the advisor in consultation with the student. HIS 481 and 482 are required for all degree candidates. At least 27 hours in history courses and nine hours in the related fields must be in upper division courses. At least six hours in history must be taken in each of two of the following areas: U.S., Latin American, British, Asian, European. A minimum grade point average of 2.25 in the 42 hours of history courses is required. (See Degree Requirements, page 53.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

History—Consists of 42 semester hours of credit, of which at least 30 must be in history courses. At least 18 of the history hours must be in upper division courses. At least three hours of credit must be taken in United States history. The remaining history and related area courses must be selected in consultation with an advisor from the Department of History. A minimum grade point average of 2.25 in history courses is required for admission to practice teaching and for graduation. The course HIS 480 may *not* be counted as part of the 42-hour major requirement.

Departmental Minor Teaching Field

Bachelor of Arts in Education Degree Curriculum

History—Consists of 24 hours of credit in history courses, of which at least nine must be in upper division courses. The program must include at least three hours in United States history.

Departmental Graduate Programs

The Department of History offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

HISTORY

Courses listed in pairs or triplicate may be taken in any order.

HIS 100, 101, 102 Western Civilization. (3, 3, 3) F, S
Traces origin and development of Western man and his institutions. HIS 100, Ancient World through the Middle Ages; HIS 101, Renaissance and Reformation through Age of Enlightenment; HIS 102, French Revolution to the present.

103, 104 The United States. (3, 3) F, S
Growth of the Republic from colonial times with the first semester covering through the Civil War period and the second continuing to the present day.

105 China: Literature and Revolution. (3) N
Novels, short stories, poems, etc. will be used to explore the social history and revolutions of modern China, with emphasis on 1915 to the present.

106 The People's Republic of China. (3) N
Analysis of major political, social, economic, and intellectual trends in China since the founding of the People's Republic in 1949.

107 Introduction to Japan. (3) A
Historical survey of the people, culture, politics, and economy of Japan, supplemented by audio-visual presentations. Intended for non-majors.

200 Latin American Civilizations. (3) N
The culture, economics, and politics of Latin American nations. *Not open to history majors.*

270 Judaism in American History. (3) N
A chronological analysis of Jews and Judaism in American history and letters.

294 Selected Topics in History. (3) N
A full description of topics for any semester is available in the History Department office. May be repeated for credit.

303, 304 American Cultural History. (3, 3) F, S
Culture in a broad connotation including ideas, ideals, the arts, and social and economic standards. First semester, the nation's colonial background and early national period; second semester, the age of industrialism and modern America.

305, 306 Asian Civilizations. (3,3) F, S
The civilizations of China, Japan, and India. The second semester may also include Southeast Asia. First se-

mester, to mid-17th century; second semester, mid-17th century to present.

320 Ancient Greece. (3) A
History and civilization of the Greek world from the Bronze Age to the Roman conquest of the Hellenistic kingdoms.

321 Rome. (3) A
History and civilization of Rome from the beginning of the Republic to the end of the Empire.

322, 323 The Middle Ages. (3, 3) A
Political, socio-economic, and cultural developments of Western Europe. First semester, Early Middle Ages; second semester, High Middle Ages.

324, 325 Renaissance and Reformation. (3, 3) A
324: Antecedents and development of the Renaissance in Italy and its spread to the rest of Europe. 325: The Protestant and Catholic Reformations in the 16th century.

326, 327 Early Modern Europe. (3, 3) A
Social, economic, cultural, and political changes in 17th and 18th century Europe. First semester, 17th century; second semester, 18th century.

329, 330 Nineteenth Century Europe. (3, 3) A
Political, social, economic, and intellectual currents in Europe from Napoleon through World War I. First semester, 1815-1866; second semester, 1866-1918.

331, 332 20th Century Europe. (3, 3) N
Europe in its world setting since World War I, emphasizing major political and social issues. First semester, 1914-1945; second semester, 1945 to the present.

351, 352 England. (3, 3) F, S
Political, economic, and social development of the English people. First semester, to the 17th century; second semester, 17th century to the present.

362 The American Indian. (3) F
History of the American Indian with emphasis on the government's Indian policy and the impact of the white man on tribal culture.

364 The Black American Experience. (3) A
The Afro-American in American history, thought and culture, emphasizing those aspects that were directly influenced by their presence.

365 Islamic Civilization. (3) F
An interdisciplinary survey of art, history and religion in Islamic civilization.

366 The Modern Middle East. (3) S
Impact of the Western world upon Middle Eastern governments, religion, and society in the 19th and 20th centuries; problems of modernization and the role of the Middle East in world affairs.

367, 368 The West in American History. (3, 3) A
First semester, the Turner Thesis of the significance of the frontier in American history, beginning with discovery and exploration and continuing to the period of Texas and the Mexican War; second semester, the development of the frontier thesis to 1890, emphasizing Arizona and the Southwest.

369 The West in the 20th Century. (3) N
Role of the western states in American history since 1890 with emphasis on politics, the environment, industry and labor, and the changing position of ethnic minorities.

370 Women in United States History, 1600-1880. (3) F
Examination of lives of American women and women's social organizations.

371 Women in United States History, 1880-1980. (3) S
Examination of lives of American women, and women's social organizations.

373, 374 United States Military History. (3,3) F, S
The implementation of American foreign and domestic policies by strategic means. Prerequisites: HIS 103 and 104. First semester: Colonial foundations to the Civil War. Second semester: America as a world power.

375 History and Theory. (3) N
Historical and theoretical sources of modernity, particularly moral and cultural relativism, value-free social science, behaviorism, humanism, Marxism and atheism.

380 History of the Mexican-American. (3) A
Role of the Mexican-American in U. S. history.

383, 384 Latin America. (3, 3) A
First semester, ancient civilization, explorers and conquerors, and colonial institutions; second semester, nationalistic development of the independent republics since 1825.

394 Selected Topics in History. (3) N
A full description of topics for any semester is available in the History Department office. May be repeated for credit.

401 American Colonial History. (3) A
Political, economic, social, and cultural history of the colonial era. Concentrates on English colonies, with some consideration of Spanish, French, and other colonial regions in North America.

403 Early National Period in American History. (3) A
Political, social, and economic development of the United States from the Revolution to 1828.

404 The Jacksonian Era. (3) N
American ideals, with emphasis on equality in the political, social, and economic life of the nation, 1828-1850.

406 Civil War and Reconstruction. (3) A
Causes and development of the war; political, constitutional, and social issues of Reconstruction, and their effects on post-war America.

407 Populism and Progressivism. (3) A
Political, social, economic, and intellectual trends in the United States, 1877-1918.

409, 410 Recent American History. (3, 3) A
First semester, 1913-1932, Wilsonian diplomacy and the First World War, the 1920s, the origins of the Great Depression, Hoover administration; second semester, 1932-1945, the New Deal, society during the Depression, Second World War.

411 Contemporary America. (3) A
The United States from 1945 to the present.

413 Origins of the American Economy. (3) F
Colonial period to 1870; pre-industrial society; farm and factory in early industrialization; rise and collapse of the slave economy.

414 The Modern American Economy.(3) S
1870 to the present; 19th century industrial base; 20th century crisis and regulation; political economy of an advanced capitalist democracy.

415, 416 American Diplomatic History. (3, 3) A
American relations with foreign powers. First semester, 1776-1898; second semester, 1898 to the present. Prerequisite: For 415, HIS 103 or permission of instructor; for 416, HIS 104 or permission of instructor.

417, 418 Constitutional History of the United States. (3, 3) N
Origin and development of the American constitutional system. First semester, colonial origins through Reconstruction; second semester, Reconstruction to the present. Prerequisite: For 417, HIS 103 or permission of instructor; for 418, HIS 104 or permission of instructor.

419, 420 American Urban History. (3, 3) A
The history of the city in American life. First semester, colonial times to the late 19th century; second semester, 19th century to the present.

421 History of American Labor. (3) A
Labor union history, ideological origins of modern labor law, and agricultural labor. Emphasis on labor problems and development in the 20th century.

422 Social History of American Women. (3) A
Women's role, status, and achievements in America. Changes in family patterns and effects of immigration, industrialization, and urbanization.

423 Recent American Intellectual History. (3) A
Major movements in 20th century science, religion, and philosophy.

424 The Hispanic Southwest.(3) N
Development of the Southwest in the Spanish and Mexican periods to 1848.

425 The American Southwest. (3) N
Development of the Southwest from 1848 to the present.

426 Indian History of the Southwest. (3) S
Comprehensive review of historical events from prehistoric peoples, the Spanish and Mexican periods, American period after 1846 to the present.

428 Arizona. (3) A
Emergence of the state from early times to the present.

430 20th Century Chicano History. (3) A
Historical development of the Chicano community in the 20th century.

431 The French Revolution and the Napoleonic Era. (3) N
Conditions in France before 1789, the Revolutionary decade from 1789 to 1799, the organization of France under Napoleon and the impact of changes in France on European society.

433 Modern France. (3) A
France since 1870.

434 Hitler: Man and Legend. (3) N
A biographical approach to the German Third Reich emphasizing nature of Nazi regime, World War II, and historiography.

435 Modern Germany. (3) A
Germany since 1840.

437, 438 Eastern Europe and the Balkans. (3,3) A
Peoples and countries of eastern and southeastern Europe in the 19th and 20th centuries. First semester, 1800-1914, emphasizing the Hapsburg and Ottoman Empires; second semester, 1914 to the present, emphasizing the successor states.

441 Imperial Russia. (3) A
Development of Russian political, economic, social, religious, and intellectual institutions and traditions from the end of the 17th century to the collapse of the tsarist autocracy in 1917.

442 The Soviet Union. (3) A
An examination of Soviet politics, economic development, and foreign relations from the 1917 Revolution to the present.

443 Russia and the United States. (3) A
Official and unofficial relations between Russia and the U.S., late 18th century to the present. Emphasizes period following the Bolshevik Revolution.

445 Tudor England. (3) A
Political, social, economic, and cultural developments in 16th century England.

446 Stuart England. (3) A
Political, social, economic, and cultural developments in 17th century England.

449 Modern Britain. (3) A
Factors contributing to Britain's position as the world's leading power in the 19th century and its decline from that position in the 20th century.

450 British Constitutional History. (3) A
Historical development of the constitutional system of Great Britain from the Middle Ages to the present, emphasizing the growth of democracy.

451 The British Empire. (3) A
British imperialism and colonialism in Africa, the Americas, Asia, and the South Pacific.

452, 453 Economic History of Modern Europe. (3,3) N
Impact of industrialism upon the political, social, and cultural life of Europe. First semester, Renaissance to the 19th century; second semester, 19th and 20th centuries.

454, 455 Intellectual History of Modern Europe. (3,3) A
Major developments in European thought from the scientific revolution to the present. HIS 454, Copernicus through Bentham; HIS 455, Karl Marx to the present.

456, 457 History of Spain. (3,3) N
Cultural, economic, political, and social development of Spain. First semester, earliest days to 1700. Second semester, 1700 to the present.

458 Age of Conquest: Latin America. (3) N
Establishment of Spanish and Portuguese empires in America. Iberian and pre-Conquest backgrounds with emphasis on the Conquest and its impact through the early 17th century.

459 Change and Reform: Colonial Latin America. (3) N
Examination of political, economic, and social institutions. Emphasis on 17th century changes and the 18th century reforms leading to independence movements.

460, 461 Spanish South America. (3,3) N
Political, economic, and social development of the Spanish-speaking nations of South America since independence. First semester, the 19th century; second semester, 20th century developments.

463 Intellectual and Cultural History of Latin America. (3) N
Main currents of thought, the outstanding thinkers and their impact on 19th and 20th century Latin America. Cultural and institutional basis of Latin American life.

464 The United States and Latin America. (3) N
The Latin American struggle for diplomatic recognition, attempts at political union, participation in international organizations since 1810, and relations between the United States and Latin America.

466, 467 Mexico. (3,3) A
Political, economic, social, and cultural developments. First semester, earliest times to 1810; second semester, 1810 to the present.

468 Brazil. (3) N
Discovery, conquest, and settlement by the Portuguese; achievement of independence; rise and fall of the empire; problems and growth of the republic to the present.

469, 470 Chinese Thought and Way. (3,3) N
469: China's classics in translation studied both for their intrinsic ideas and for the origins of Chinese thought. 470: Evolution of Confucian Tao (Way), its synthesis of Taoism and Buddhism, and 20th century reactions to that Tao.

471 The United States and Japan. (3) A
Cultural, political, and economic relations in the 19th and 20th centuries. Emphasis on post World War II period.

472 The United States and China. (3) N
Emphasis on viewing from both sides the rollercoaster ride of cultural, political, and economic relations in the 20th century.

473, 474 China. (3, 3) A
Political, economic, social, and cultural history of the Chinese people. First semester, early times to the late 17th century; second semester, mid-17th century to the present.

475 The American Experience in Vietnam, 1945-75. (3) N
Intersection of American and Asian histories in Vietnam, viewed from as many sides as possible.

476 Modern Southeast Asia. (3) N
Imperialism and revolution in 19th and 20th century Southeast Asia.

477, 478 Japan. (3, 3) A
Political, economic, social, and cultural history of the Japanese people. First semester, early times to the 19th century; second semester, 19th century to the present.

479 The Chinese Communist Movement. (3) N
Analysis of the communist movement in 20th century China, with emphasis on its historical setting.

480 Methods of Teaching History. (3) F
Methods in instruction, organization, and presentation of the subject matter of history and closely allied fields.

481 Quantification in History. (3) A
Quantitative techniques: political analysis, new economic theory, demography, and social history. Research methods in social science: design, data collection, and computer skills. Prerequisite: MAT 106 or equivalent.

482 Historical Statistics. (3) A
Historical data analysis: sampling distributions, tests of hypotheses; t-tests to multiple regression; nonparametric techniques. Prerequisite: HIS 481.

501 Historical Research and Writing. (3) F
Surveys current methodological practices, recent historical monographs, and the research skills and tools used by historians. Required of students in historical editing emphasis.

502 Public History Methodology. (3) F
Introduction to historical research methodologies, techniques, and strategies used by public historians. Readings, short papers, guest speakers. Required for public history business emphasis.

503 Public History Research. (3) S
Individual and group research projects utilizing the approaches and techniques of the public historian. Required for public history business emphasis.

515 Studies in Historiography. (3) F, S
Methods and theories of writers of history. May be repeated for credit.

520 Historical Editing and P ublishing Procedures I. (2) F
Introduction to editing of scholarly journals and books. Covers manuscript evaluation and preparation, copy editing, proofreading, and related topics.

521 Historical Editing and Publishing Procedures II. (2) S
Advanced work in copy editing, substantive editing, and manuscript evaluation. Includes treatment of author-editor relations and preparation of indexes. Prerequisite: HIS 520.

522 Issues in Historical Editing. (2) F
Survey of journal and textbook publishing, including publishing law, financial aspects of publishing, book design, printing technology, and related topics. Prerequisites: HIS 520, 521 and 584 (Editing Internship).

530 American Business History. (3) F
Origins, evolution, and present form of various major U.S. industries. Required for public history business option.

591 Seminar. (3) N
May be repeated for credit. Topics may be selected from the following areas:

(a) United States History
(b) European History
(c) English History
(d) Latin American History
(e) East Asian History
(f) British History

Special Courses: HIS 294, 298, 394, 484, 492, 493, 494, 497, 498, 499, 500, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 600, 680, 683, 684, 690, 691, 692, 693, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

Home Economics

PROFESSORS:
HOOVER, MONTS, MORGAN
ASSOCIATE PROFESSORS:
HUGHSTON (HEC 106), BAKER, MONTE
ASSISTANT PROFESSORS:
CREIGHTON, FABES, HARTWIGSEN, HUNTER, JOHNSON, MANORE, PETERS, ROOSA, VAUGHAN

Departmental Major Requirements

The Department of Home Economics awards the Bachelor of Arts or Bachelor of Science degree upon successful completion of a four-year curriculum of 126 semester hours as prescribed on page 53 under the College of Liberal Arts. Course HEC 330 is required. Six hours of the home economics courses listed on page 55 and not within the major area of specialization may be applied to fulfill the Liberal Arts General Studies requirements.

For either the B.A. or B.S. degree, students must select one of the following areas of concentration:

Family Studies/Child Development

Human Nutrition-Dietetics with an option in:

1) Nutritional Science or 2) Dietetics (general, management, clinical, or community)

General Home Economics

Home Economics Education

Home Economics in Business with an option in:

1) Food Service Management, 2) Consumer Service in Foods, or 3) Textiles and Clothing

When field experience is included in the curriculum to complete requirements for graduation, students should register for HEC 451 Field Experience, identifying it with the area of specialization.

American Dietetic Association requirements consist of 68 hours of approved courses leading to an internship. See chair of department for further information.

Bachelor of Arts Degree Curriculum

Home Economics—Consists of 45 semester hours of credit of which 30 are in home economics and 15 in related fields; 20 semester hours of credit must be in home economics upper division. The specific courses will be determined by the student in consultation with the advisor, depending on the area of specialization. (See Degree Requirements and Foreign Language Requirement, page 53.)

Bachelor of Science Degree Curriculum

Home Economics—Consists of 50 semester hours of credit of which at least 20 must be in upper division home economics courses. The specific courses will be determined by the student in consultation with the advisor, depending on the area of specialization. (See Degree Requirements, page 53.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree

Home Economics—Consists of 36 semester hours of credit in home economics. Major courses required are: TXC 123; FON 141, 142; CDE 232†; PGS 100; SOC 101; CDE 337; FAS 331†, 357†; HEC 451†; HEE 461†, 480, 481. Select two from HEE 153; DEH 272, 373. General Studies courses required: DEH 172, FAS 354, CHM 101 or 113†, a mathematics course, and an American history course. Remaining credits to meet major requirements are selected in consultation with advisor.

Center for Family Studies

The Center for Family Studies is an educational, research and service agency of the University within the College of Liberal Arts in the Department of Home Economics. The Child Development Laboratory is affiliated with the Center. The main purpose of the Center is to carry out research programs which foster the understanding of family life from an interdisciplinary point of view. Policies and programs of the Center are guided by an interdepartmental advisory committee.

Departmental Graduate Programs

The Department of Home Economics offers programs leading to the degree of Master of Science. Consult the *Graduate College Catalog* for requirements.

CHILD DEVELOPMENT

CDE 232 Child Development. (3) F, S
Development from conception through later childhood. Significance of family membership. Recognition of individuality within the universal pattern of human development. Guided observations. Prerequisites: PGS 100, SOC 101.

337 Guided Interaction with Children. (3) F, S
Discussion and application of methods for communicating with children and for guiding young children in cognitive and social learning experiences. Participation in the Child Development Laboratory. Prerequisite: CDE 232 or equivalent. Two lectures, 3 hours laboratory.

430 Infant/Toddler Development in the Family. (3) F
An examination of the development of infants/toddlers, the socialization processes of families, and the interactions of these processes. Prerequisite: CDE 337† or equivalent.

434 Organization and Administration of Preschools. (3) N
Planning, operation and evaluation of programs for young children as related to national regulations, needs of the child, family and community. Investigation of exemplary programs. Prerequisite: CDE 337† or approval of instructor. May include field trips.

437 Analysis of Child Behavior. (3) S
Use of a holistic perspective including family and environmental factors as well as observation of the child. Prerequisites: CDE 430† plus 6 semester hours of psychology. Two lectures, 3 hours laboratory.

531 Advanced Child Development. (3) F
Major developmental theories, related research, and their application to family interaction. Prerequisites: CDE 430† and CDE 437† or permission of instructor.

533 Research Issues in Child Development. (3) S
An indepth exploration and critique of research focusing on child development in a family setting. Prerequisites: HEC 500, CDE 531†.

534 Systems Approach to Analysis of Child Behavior. (3) F
Using systems perspective to focus on early childhood developmental and behavioral problems. Identify and analyze problem behaviors and develop systematically appropriate strategies. Prerequisites: HEC 500, CDE 531†. May include lab.

FAMILY STUDIES

FAS 330 Personal Growth in Human Relationships. (3) F, S
Personal development and behavior as related to competency in interpersonal relationships within the family. Processes of family interaction. Prerequisites: SOC 101 and PGS 100, or equivalents.

331 Family Relationships. (3) F, S
Issues, challenges and opportunities relating to present day family living. Factors influencing inter-relations within the family. Prerequisite: course in psychology or sociology.

332 Human Sexuality. (3) F, S
Relationship of sexuality to family life and to major societal issues. Emphasis on developing healthy, positive, and responsive ways of integrating sexual and other aspects of human living. Prerequisite: PGS 100.

354 Consumer Economics: Issues. (3) F, S
Relationship of the consumer to the economy as a determinant of the family pattern of living. Current consumer problems and sources of protection.

357 Management in the Family. (3) F, S
Management as a means to realization of individual and family values and goals; creation, allocation and use of resources. Focus on decision making. Prerequisites: SOC 101 and PGS 100 or equivalent.

430 Parent-Child Relationships. (3) S
Needs of parents and children and the dynamics of parent-child interaction, centering on the years in the family life cycle through the children's elementary school experiences. Prerequisite: CDE 232† or FAS 330† or 331†.

431 Parent-Adolescent Relationships. (3) F
Dynamics of the relationships between parents and adolescents. Developmental characteristics of adolescence and the corresponding adult stage. Prerequisites: CDE 232†, FAS 331†.

432 Family Development. (3) N
Normative changes in families over time, from formation until dissolution. Emphasis on the marital subsystem in middle and later years. Prerequisites: CDE 232† and FAS 331†, or approval of instructor.

435 Advanced Family Relationships. (3) F
Recent research, issues and trends relating to family interaction. Influence of family composition, physical environment, family patterns and values on family dynamics. Prerequisite: FAS 331†.

436 Conceptual Frameworks in Family Studies. (3) S
Significant organizing approaches to study of the family with particular focus on the eco-system, interactional and developmental frameworks. Application to diverse individual and family situations. Prerequisites: FAS 331†, 357 or 454†, and CDE 232†.

440 Fundamentals of Counseling. (3) S
Counseling in relation to family interaction; attention to communication skills relevant to a variety of helping relationships.

454 Consumer Economics: Family Finance. (3) S
Major family income and expenditure alternatives in attainment of family goals.

535 Family Relationships in the Middle and Later Years. (3), N
Developmental processes and generational relationships of the family in the middle and later stages of the family life cycle. Prerequisites: CDE 232†, FAS 331† or approval of instructor.

536 Family Crises and Resources. (3) N
Special problems encountered in the family. Individual and community resources for approaching them. Prerequisites: FAS 330†, CED 522 or equivalent.

537 Individual Development in the Family Milieu. (3) N
The family as a framework for human development. Reciprocal influence between individual and family development. Prerequisites: CDE 232†, FAS 331†.

538 Approaches to Marriage and Family Counseling. (3) N
Methods currently used in marriage and family counseling and consideration of theoretical bases underlying the methods. Prerequisite: approval of instructor.

551 Family Decision-Making. (3) F
Theory and research focusing on centrality of decision to management in family settings. Ecological systems approach to family decision issues. Prerequisite: FAS 357† or approval of instructor.

554 Family Economics. (3) N
Analysis of public policy affecting family economic behavior with respect to divorce, taxation, credit, population, and other issues. Prerequisite: FAS 354 or ECN 201 or ECN 500†.

591 Seminar. (3) N
May be repeated for credit. Topics may be selected from the following areas: a) Consumer Education; b) Cross-Cultural Management; c) Issues of Scarce Resources; d) Values.

FOOD AND NUTRITION

FON 141 Human Nutrition. (3) F, S
Basic principles of human nutrition as they relate to health and well-being of individuals and families. Emphasis on the nutrients and factors which affect their utilization in the human body.

142 Applied Food Principles. (3) F, S
Applied scientific principles of food preparation and production. Two lectures, 3 hours laboratory.

341 Food: Management and the Consumer. (3) S
Factors affecting the food supply, consumer protection, buying and management of human and material resources. Laboratory: Planning, organizing, preparing and serving food; management of time, money and energy; consideration of nutrient needs, food quality and consumer acceptability. Prerequisites: FON 141, 142. Two lectures, 3 hours laboratory.

343 Food Service Systems Procurement. (3) F
Food purchasing for institutions: cost factors, food laws, quality standards, and basic manufacturing processes. Prerequisite: FON 341† or approval of instructor. Two lectures, 3 hours laboratory. Field trips may be taken.

344 Food Service Systems Management. (3) S
Organization, administration, and management of food service in hospitals and other institutions. Prerequisite: FON 343† or approval of instructor. Two lectures, 3 hours laboratory. Field trips may be included.

440 Advanced Human Nutrition I. (3) F
Metabolic reactions and interrelationships of vitamins, minerals, and water. Prerequisites: FON 141, ZOL 202†, and CHM 361†. CHM 332† recommended.

441 Advanced Human Nutrition II. (3) S
Metabolic reactions and interrelationships of carbohydrate, lipid, and protein. Prerequisites: FON 141, ZOL 202†, and CHM 361†. CHM 331†, 332 recommended.

442 Experimental Foods. (4) F
Food product development techniques, food evaluation and testing, and investigation of current research into food composition. Prerequisites: FON 142, CHM 231†. Two lectures, 6 hours laboratory.

444 Diet Therapy. (3) S
Principles of nutritional support for prevention and treatment of disease. Prerequisites: FON 141 and ZOL 202.

445 Quantity Food Production. (3) F
Standard methods of food preparation in quantity; operation of institutional equipment, menu planning for

institution. Experience in quantity food service. Prerequisites: FON 141, 343†, and 344†, or approval of instructor. One lecture, 6 hours laboratory. May require field trips.

446 Human Nutrition Assessment Laboratory. (4) N
Clinical and bio-chemical evaluation of nutritional status. Prerequisites: CHM 367† and FON 440† or 441†. One lecture, 9 hours laboratory.

448 Community Nutrition. (3) F
Food-related behaviors; community organization and delivery of nutrition services; program design, implementation, and evaluation strategies; and nutritional assessment of population groups. Prerequisite: FON 141. SOC 101 and PGS 100 are recommended.

450 Nutrition in the Life Cycle I. (3) F
Emphasis on nutritional needs and problems during pregnancy, lactation, infancy, and childhood. Prerequisite: FON 141.

451 Nutrition in the Life Cycle II. (3) S
The nutritional requirements and nutrition-related disorders of adolescence, middle adulthood, and later life. Prerequisite: FON 141.

462 Consumer Service in Foods. (3) N
Organization, economics, and marketing as related to the food and equipment industries. Prerequisite: FON 142.

541 Recent Developments in Nutrition. (3) N
Survey of research. Prerequisite: FON 440† or 441† or approval of instructor.

542, 543 Current Research in Nutrition I, II. (3-3) N
I. Vitamins and Minerals. II. Carbohydrates, Lipids, and Proteins. Prerequisite: FON 141 or equivalent or approval of instructor.

548 Recent Developments in Foods. (3) N
Discussion and critique of current research. Prerequisites: FON 142 and CHM 232†.

HOME ECONOMICS

HEC 271 Creative Textiles. (3) N
Ancient textile techniques and their relationship to today's life style. Creative experiences in a variety of techniques. May include field trips. One lecture, 4 hours studio.

272 Basic Issues in Housing. (3) F
The study of housing: human needs, effects of the housing environment upon humans; legal and financial trends.

330 Research Issues in the Family. (3) F, S, SS
Study of current research issues in various areas which affect family life and individuals within families. For majors only. Prerequisites: Junior standing or above.

451 Field Experience. (1-12) N
Supervised study in the area of student's specialization (CDE, FAS, FON, HEE, TXC) in cooperation with community business institutions. Students must make arrangements with instructor one semester in advance of enrollment. Prerequisite: completion of 60 hours and approval of instructor. For Family Management (FAS) majors, prerequisite: FAS 357. May be repeated for a total of 3 hours. For Textiles and Clothing (TXC) majors intern program (credit 12 hours), prerequisite: grade point average of 3.0, senior standing the semester of program participation, TXC 122, ECN 111 or 112, MKT 300.

472 Housing and Society. (3) S
Family housing as affected by legislation with application to contemporary housing.

476 Socio-Psychological Aspects of Housing. (3) N
Social and psychological factors affecting individual and family housing decision making. Prerequisite: HEC 272.

500 Research Methods. (3) F
Purposes of research. Experimental design, methods of data collection, thesis proposal development.

572 Current Housing Issues. (3) N
Focuses on selected current housing issues, their relationship to and effect on the family.

HOME ECONOMICS EDUCATION

HEE 153 Analysis of Home Equipment. (3) S
Equipment for the home. Principles of construction, operation, selection and effective use of equipment. Two lectures, 3 hours laboratory. May include field trips.

453 Advanced Analysis of Home Equipment. (3) N
Current trends in home appliances. Adaptations for individuals having special needs. Kitchen and laboratory planning. Prerequisite: HEE 153 or approval of instructor. Two lectures, 3 hours laboratory. May include field trips.

461 Presentations in Home Economics. (1-3) S
I, Application of demonstration principles; II, Multimedia presentations; III, Development of audiovisual materials for home economics. Prerequisites: junior standing and approval of instructor. One hour lecture, 6 hours laboratory for each module.

480 Methods of Teaching Home Economics. (3-4) F
Instruction, organization, presentation and evaluation of subject matter in home economics. HEE students register for 4 credits. Dietetic students register for 3 credits.

481 Teaching Occupational Home Economics. (3) S
Career orientation related to home economics, cooperative work-related instruction, programs and youth club advisement associated with secondary home economics programs. Open only to home economics majors or minors. May include field trips.

582, 583 Program Planning and Evaluation in Home Economics. (3, 3) N
Process of planning and providing accountability for individual progress.

584 Current Trends of Teaching Home Economics. (3) N
Focus on teaching home economics related to current issues and problems facing families and society. Open only to home economics majors or minors.

585 Administration and Supervision of Home Economics Education. (3) N
Development of individuals for state, city, school, and college leadership roles. Emphasis on supervision of students teachers.

586 Current Trends of Teaching Home Economics. (3) N
Focus on teaching home economics related to current issues and problems facing families and society. Open only to home economics majors or minors.

TEXTILES AND CLOTHING

TXC 122 Clothing and Human Behavior. (3) F, S
Emphasizes cultural influences, human behavior and design.

123 Clothing Construction. (3) F, S
Construction processes related to fabrics, design and fashions. Course may be waived on successful completion of a placement test given each semester during orientation week. One lecture, 4 hours studio.

223 *Introduction to Textiles.* (3) F, S
Basic properties, processing, end uses, and care of textile products.

321 Pattern Designing. (3) F, S
Flat patterns used to develop fundamental principles in designing individualized garments. Prerequisites: TXC 122, 123. *One lecture, 4 hours studio.*

323 Advanced Textiles. (3) F, S
Textile technology, fiber science, dyeing, finishing, and other topics. Prerequisites: TXC 223, CHM 101; CHM 231† is recommended. Two lectures, 3 hours laboratory. May include field trips.

423 Apparel Analysis. (3) F, S
Specialized processes used with a wide variety of apparel fabrics. Interrelationships between fabric properties and apparel design. Prerequisite: TXC 321†. Two lectures, 2 hours studio. May include field trips.

424 *History of Costume.* *(3)* F, S
Evolution of costume from ancient Egypt to the 20th century. Prerequisites: TXC 122 and an ARH course. May include field trips.

425 Twentieth Century Apparel. (3) F, S
Cultural, decorative, and functional influences on clothing. Prerequisite: TXC 424†.

426 The Clothing and Textile Industries. (3) F, S
Organization and marketing problems and practices specific to the textile and clothing industries. Prerequisites: TXC 122, 223, ECN 112.

429 *Textile Analysis.* *(3)* N
Introduction to textile testing equipment and evaluation of data. Prerequisite: TXC 323†. Two lectures, 3 hours laboratory. May include field trips.

521 Experimental Textile Analysis. (3) N
Current textile research and methods. Individual projects relating to textile performance. *Prerequisite:* approval of instructor. May include field trip.

523 Sociopsychological Aspects of Clothing. (3) N
Socio-psychological theories applied to the selection and use of clothing. Prerequisites: TXC 122; SOC 101, ECN 112.

526 Clothing and Textile Economics. (3) N
A profile of textiles-related industries, government and labor demands, consumer expectations, and new products and markets. Prerequisites: ECN 201 and two textile courses.

Special Courses: *FAS, FON, HEC, HEE, TXC 294, 484,* 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 35-36.)

Interdisciplinary Humanities Program

PROFESSOR:
Bettie Anne Doebler, Director

Departmental Major Requirements

Bachelor of Arts Degree Program

Humanities—The major in humanities is interdisciplinary and may be intercollegiate; it consists of 45 hours. It is recommended that students take some 12 hours of supporting courses which may be credited towards general studies requirements where appropriate. In consultation with an adviser, the student will take 29 hours of interdisciplinary humanities courses, including 1) a core of 14 hours: HUM 110, HUM 301, 302, HUP 318 or HUM 498; and 2) 15 hours of courses selected to develop an interdisciplinary cultural or area concentration (examples: medieval or Renaissance studies). To balance the breadth of the interdisciplinary concentration, the student will also 3) take 16 hours of course work from those courses required for one of the humanities disciplinary majors. See this catalog for requirements for Art, Anthropology *(cultural)*, Dance, English, Foreign Languages, History, Music, Philosophy, Religious Studies, and Theatre. Twelve additional hours of supporting courses in consultation with the adviser are recommended especially to broaden the student's historic and aesthetic understanding. They are to be selected from the following disciplines: art history, dance, English, foreign languages, history, music, philosophy, religious studies and theatre.

Graduate Program

The program also offers the Master of Arts degree *in Humanities through the Committee on Humanities.* Consult the *Graduate College Catalog* for requirements.

HUMANITIES

HUM 110 Contemporary Issues in Humanities. *(3)* F, S
Responses of literature, art history, history, philosophy, religion and other disciplines to common problems affecting modern American life.

301, 302 Humanities in the Western World. (4,4) F, S
Interrelation of arts and ideas in Western Civilization. HUM 301, Hellenic through Medieval; 302, Renaissance to the present. Three lectures, one discussion meeting per week.

413 Comedy: Meaning and Form. (3) S
Nature and characteristics of comedy in the literary, fine, and performing arts. *Prerequisite: HUM 301 and* 302 or equivalent.

414 Tragedy: Meaning and Form. (3) A
Nature and characteristics of literary and artistic expressions called tragic. Prerequisite: HUM 301 and 302 or equivalent.

494 Special Topics in the Humanities. (3) N
Open to all students. Topics include:

(a) Western Historical or Contemporary Cultures
(b) Non-Western Cultures
(c) Cultures of Ethnic Minorities
(d) American Fine Arts
(e) Comparative Fine and Performing Arts

498 Pro-Seminar in the Humanities. (3) A
Methodologies and comparative theories for the study of relationships between various aspects of culture, the history of ideas, and the arts. For students with a major

in humanities with upper-division standing. May be repeated for a total of 6 hours credit when topics vary.

501 Interpretation of Culture. (3) A
Methodologies and comparative theories for the study of relationships between various aspects of culture, the history of ideas, and the arts. May be repeated for a total of 6 hours credit, when topics vary.

HUP 318 Perception and Judgment in the Arts. (3) A
Application of perception theory to the arts. Creativity; art forms as icons of reality; the role of language in evaluation.

Additional courses may be selected from Cultural Anthropology, Architecture, Art, Communication, Cultural Geography, Intellectual and Cultural History, Dance, Foreign Languages and English (Literature), Journalism and Telecommunication, Music, Philosophy, and Theatre.

Special Courses: HUM 294, 492, 493, 497, 499, 590, 592, 598, 599. (See pages 35-36.)

Liberal Arts

Interdisciplinary (LIA) courses offered by the College of Liberal Arts.

LIA 100 University Adjustment and Survival. (3) F, S, SS
Analysis of student motivation and goals. Reinforcement of language facility and study skills. Use of the library. Orientation to University resources and procedures. Special section offered for mature women returning to higher education.

101 The Use of Research Libraries. (1) F,S
Interdisciplinary resources and services of the University Library, with an emphasis on research. Open to freshmen and sophomores.

171H, 172H, The Human Event. (3-3) F, S
Landmarks in the social and intellectual development of the human race, with emphasis on Western Civilization. Enrollment restricted to members of the Honors Program. Consult the Honors office for applicability to General Studies requirements.

Special Courses: LIA 294, 298, 484, 492, 493, 494, 497, 498, 499.

Mathematics

PROFESSORS:
BUSTOZ (PS A-216), ANDERSON, APOSTOL, BYRNES, FELDSTEIN, GOLDSTEIN, GRACE, HERRERO, ISMAIL, JACOBOWITZ, KELLY, LEONARD, McDONALD, MITTELMANN, NERING, SAVAGE, SHERMAN, H. A. SMITH, L. SMITH, A. WANG, C. WANG, WEISS, YOUNG

ASSOCIATE PROFESSORS:
BEDIENT, BREMNER, DRISCOLL, FARMER, HASSETT, HELTON, IHRIG, KUIPER, KURTZ, McMAHON, MOORE, RODMAN, SANSONE, H. L. SMITH, STEWART, SWIMMER

ASSISTANT PROFESSORS:
BANUELOS, KADELL, LISKOVEC, McCARTER, PECK, QUIGG, RINGHOFER, TAYLOR, WOODFIELD

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Mathematics—Consists of 45 semester hours of which at least 30 must be in mathematics and the remaining hours in closely related fields to be approved by the advisor. The required courses must include MAT 270†, 271, 272, 219, 274, 342, 371 or 460, two 400-level mathematics courses to be approved by the advisor, and CSC 100† or 183†. The department recommends a one-year sequence in some closely related field. Students who plan to attend graduate school in mathematics should consult their advisor concerning an appropriate curriculum as early as possible. (See Foreign Language Requirement, page 53.)

Bachelor of Science Degree Curriculum

Mathematics—Consists of 55 semester hours of which at least 42 must be in mathematics and the remaining hours in closely related fields to be approved by the advisor. The required hours must include MAT 270†, 271, 272, and 342, and CSC 100† or 183†. To satisfy the remaining required hours the following options are available:

General Mathematics Option. Requires MAT 219, 274, 371 and 372. The remaining hours in mathematics are to be approved by the advisor and must include 9 hours at the 400-level. The department recommends a one-year sequence in some closely related field.

Computational Mathematics Option. Requires MAT 243, 274, 371, 464-465, 467,

STP 326 or 420 or 421, CSC 100-101, 200, and 210. The remaining hours are to include three 400-level courses, at least two of which must be in mathematics, and all of which must be approved by the advisor.

Applied Mathematics Option. Requires MAT 274, 371, 372, MAT 419 or IEE 473, MAT 451, 461, 462, 464. PHY 115-116 also is required and the corresponding laboratory course (PHY 117-118) is strongly recommended. Students should choose additional courses from MAT 415, 416, 419, 443, 463, 465, 472, 475, STP 421, 425, 427, IEE 476†, and CSC 101.

Statistics and Probability Option: Requires MAT 219, 371, 372, STP 421, and one course from each of two of the following groups: (a) STP 427; (b) STP 425; and (c) MAT 419, IEE 473†, 476†. The remaining courses in mathematics, to be approved by the advisor, may be selected from the three groups above or from among MAT 464, 465, 466, STP 420, 429, CSC 101. A coherent set of courses in a related field is also required.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Mathematics—*Option 1.* Consists of at least 36 semester hours in mathematics. Required courses are MAT 219†, 270†, 271, 272, 310, 342, 274 or 371 or 460, 443 and MTE 483†, STP 420 and CSC 100† or 183†. MTE 482† is required as part of the 31-hour professional education requirement, but cannot be counted as part of the 36-hour major requirement.

Mathematics—*Option 2.* This option may be exercised only in combination with Option 2 in Chemistry (page 73) or Physics (page 118). The mathematics portion of this 60-hour program consists of 30 semester hours of credit in mathematics. Required courses are MAT 219†, 270†, 271, 272, 310, 342, 274 or 371 or 460, and 443. A computer science course (CSC 100† or 183†) is recommended.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Mathematics—Consists of at least 24 semester hours of credit. Required courses are MAT 219†, 270†, 271, 272, 310, 342, and one of 274, 371, 460.

Departmental Graduate Programs

The Department of Mathematics offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

MATHEMATICS

MAT 106 Intermediate Algebra. (3) F,S,SS
Topics from basic algebra such as linear equations, polynomials, factoring, exponents, roots and radicals. Prerequisite: One year of high school algebra.

115 College Algebra and Trigonometry. (4) F,S,SS
A pre-calculus course on those topics in algebra and trigonometry which are essential to the study of analytic geometry and calculus. Not open to students with credit in MAT 117 or 118. Prerequisite: three semesters of high school algebra or MAT 106†.

117 College Algebra. (3) F,S,SS
A pre-calculus course on topics in algebra and properties of elementary functions which are essential to the study of analytic geometry and calculus. Not open to students with credit in MAT 115. Prerequisite: three semesters of high school algebra or MAT 106†.

118 Plane Trigonometry. (2) F,S,SS
A pre-calculus course on topics in trigonometry which are essential to the study of analytic geometry and calculus. Not open to students with credit in MAT 115. Prerequisite: MAT 117† or equivalent.

119 Finite Mathematics. (3) F,SS
Topics from set theory, probability and linear algebra. Applications will be emphasized. Prerequisite: MAT 115† or 117† or equivalent.

141 Mathematics for the Social, Life and Management Sciences. (4) F,S,SS
Set theory, systems of equations, matrix algebra and other topics of interest to students in the social, life, and management sciences. Prerequisite: MAT 106† or equivalent.

205 The Creative Art of Mathematics. (3) F, S, SS
Topics chosen to illustrate the historical and conceptual development mathematics. Prerequisite: MAT 106 or equivalent.

210 Mathematical Analysis. (3) F,S,SS
Differential and integral calculus of elementary functions, with applications. Not open to students with credit in MAT 260, 270 or 290. Prerequisite: Mat 115† or 117† or 141† or equivalent.

219 Mathematical Structures. (3) S
Sets, functions, proofs, probability, nature of mathematical models. Intended for sophomore mathematics majors and others interested in the nature of mathematics. Prerequisite: one semester of calculus or approval of instructor.

242 Elementary Linear Algebra. (2) F,S,SS
Introduction to matrices, systems of linear equations, determinants, vector spaces, linear transformations, and eigenvalues. Emphasizes development of computational skills. Prerequisite: A semester of calculus or approval of instructor.

243 Discrete Mathematical Structures. (3) F,S
Introduction to lattices, graphs, Boolean algebras, and groups, with emphasis on topics relevant to computer science. Prerequisite: sophomore standing, or approval of instructor.

260, 261 Technical Calculus I, II. (3-3) F,S,SS
Analytic geometry, differential and integral calculus of elementary functions emphasizing physical interpretation and problem solving. Not open to students with credit in MAT 270 or 290. Prerequisite for MAT 260:

MAT 115† or equivalent; prerequisite for MAT 261: MAT 260† or approval of instructor.

270 Calculus with Analytic Geometry I. (4) F,S,SS
Real numbers, limits, and continuity, differential and integral calculus of functions of one variable. [Not open to students with credit in MAT 290. The sequence MAT 270-271 may be substituted for MAT 290 to satisfy requirements of any curriculum.] Prerequisites: MAT 115†, or 117† and 118†, or equivalent.

271 Calculus with Analytic Geometry II. (4) F,S,SS
Methods of integration, applications of calculus, elements of analytic geometry, improper integrals, sequences and series. [Not open to students with credit in MAT 291. The sequence MAT 270-271-272 may be substituted to satisfy requirements for MAT 290-291.] Prerequisite: MAT 270† or equivalent.

272 Calculus with Analytic Geometry III. (4) F,S,SS
Vector-valued functions of several variables, multiple integration, introduction to vector analysis. [The sequence MAT 270-271-272 may be substituted to satisfy requirements for MAT 290-291.] Prerequisite: MAT 271† or equivalent.

274 Elementary Differential Equations. (3) F,S,SS
Introduction to ordinary differential equations, adapted to the needs of students in engineering and the sciences. Prerequisite: MAT 271† or equivalent is required; credit in MAT 272† or equivalent, is recommended.

290 Calculus I. (5) F,S
Differential and integral calculus of elementary functions; topics from analytic geometry essential to the study of calculus. Prerequisites: MAT 115†, or 117† and 118†, or equivalent.

291 Calculus II. (5) F,S
Further applications of calculus, partial differentiationtegrals, and infinite series. Prerequisite: MAT 290† or equivalent.

310 Introduction to Geometry. (3) F,S
Congruence, area, parallelism, similarity and volume, Euclidean and non-Euclidean geometry. Prerequisite: MAT 272† or equivalent.

342 Linear Algebra. (3) F,S,SS
Linear equations and matrices, vector spaces, determinants, linear mappings, eigenvalues, inner product spaces, and bilinear forms. Prerequisite: credit or concurrent registration in MAT 272†, or equivalent.

362 Advanced Mathematics for Engineers and Scientists I. (3) F,S,SS
Complex numbers, partial differentiation, multiple integrals, vector analysis and Fourier series. Prerequisite: MAT 272† or equivalent.

363 Advanced Mathematics for Engineers and Scientists II. (3) N
Special functions, complex variables, integral transforms, partial differential equations and probability. Prerequisites: MAT 274† and 362† or equivalent.

371 Advanced Calculus I. (3) F
Continuity, Taylor's theorem, partial differentiation, implicit-function theorem, vectors, linear transformations and norms in R^n, multiple integrals, power series. Prerequisite: MAT 272† or equivalent, and credit or concurrent registration in MAT 342†.

372 Advanced Calculus II. (3) S
Maps from R^n to R^m, line and surface integrals, divergence and Stokes' theorems, R^m – topology, series, uniform covergence, improper integrals. (Not open to students with credit in MAT 460). Prerequisite: MAT 371†.

400 Computability and Unsolvability. (3) N
Turing machines and computability, computable and partial computable functions, recursive sets and predicates, recursively enumerable sets, unsolvable decision problems, applications. Prerequisite: MAT 243†.

401 Theory of Formal Languages. (3) N
Theory of grammar, methods of syntactic analysis and specification, types of artificial languages, relationship between formal languages and automata. Equivalent to CSC 459. Prerequisite: MAT 243† or 342†.

410 Introductory Topology. (3) F
Topology of the real numbers, equivalence of sets, transfinite induction. Designed to develop the student's critical faculties and creative abilities in mathematics. Prerequisite: MAT 272† or equivalent.

412 Projective Geometry. (3) N
Projective geometry and its relationship to Euclidean and other geometries. Prerequisite: MAT 342†. MAT 310† is recommended.

415 Combinatorial Mathematics I. (3) F
Permutations and combinations, recurrence relations, generating functions, graph theory and combinatorial proof techniques. Prerequisite: MAT 342†.

416 Combinatorial Mathematics II. (3) S
Continuation of MAT 415 considering some advanced aspects of the theory as well as applications. Topics to be chosen: transport networks, matching theory, block designs, coding theory, Polya's counting theory, and applications to the physical and life sciences. Prerequisite: MAT 415† or approval of instructor. MAT 443† is recommended.

419 Linear Programming. (3) S
Linear programming and the simplex algorithm, network problems, quadratic and nonlinear programming. Prerequisite: One semester of college calculus.

431 Foundations of Mathematics. (3) N
Topics from mathematical logic and set theory. May be repeated for credit with approval of instructor. Prerequisite: MAT 342† or approval of instructor.

442 Advanced Linear Algebra. (3) F,S
Deeper and more abstract study of the topics in MAT 342. Invariant subspaces, canonical forms and matrices, linear programming, dual spaces, bilinear and quadratic forms, and multilinear algebra. Prerequisite: MAT 342† or equivalent.

443 Abstract Algebra. (3) A
Introduction to the most important algebraic structures including groups, rings, integral domains, and fields. Prerequisite: MAT 342† or approval of instructor.

445 Theory of Numbers. (3) A
Prime numbers, unique factorization theorem, congruences. Diophantine equations, primitive roots, quadratic reciprocity theorem. Prerequisite: MAT 342†.

451 Mathematical Modeling. (3) A
An in-depth study of one or more mathematical models which occur in the physical or biological sciences, May be repeated for credit with approval of instructor. Prerequisites: MAT 274†, and 242† or 342†, or approval of instructor.

460 Applied Real Analysis. (3) A
Vectors, curvilinear coordinates, Jacobians, implicit function theorem, line and surface integrals, Green's, Stokes' and divergence theorems. (Not open to students with credit in MAT 372). Prerequisites: MAT 274† and 242† or 342†.

461 Applied Complex Analysis. (3) F,S
Analytic functions, complex integration, Taylor and Laurent series, residue theorem, conformal mapping, and harmonic functions. Prerequisite: MAT 272† or equivalent.

462 Partial Differential Equations. (3) F,S,SS
Second order partial differential equations, emphasizing Laplace, wave and diffusion equations, solutions by the methods of characteristics, separation of variables and integral transforms. Prerequisite: MAT 274†.

463 Transform Theory and Operational Methods. (3) A
Fourier, Laplace, and other transforms; applications to boundary value problems; generalized functions and modern operational mathematics. Prerequisite: approval of instructor.

464 Numerical Analysis I. (3) F
Theory and methods for: numerical solution of algebraic and transcendental equations; iterative methods; approximation; quadrature; solution of differential equations. Those seeking a methods survey course should take MAT 466. Prerequisites: Fluency in computer programming (preferably Fortran), and MAT 342† and 371†, or approval of instructor.

465 Numerical Analysis II. (3) S
Continuation of MAT 464. Prerequisite: MAT 464†.

466 Applied Computational Methods. (3) F,S
Numerical methods for: quadrature, differential equations, roots of nonlinear equations, interpolation, approximation, linear equations, floating-point arithmetic, roundoff error. Prerequisites: Fluency in computer programming (preferably Fortran), and MAT 271† or equivalent, or approval of instructor.

467 Computer Arithmetic. (3) S
Number systems, hardware/software arithmetic, overflow, significance, rounding, multiple precision, automatic error control; impact on languages, architectures, robust programming, software development. Prerequisites: CSC 101†, or 200†, or 383†, or MAT 464†, or 466†, or approval of instructor.

472 Intermediate Real Analysis. (3) F
Topology of the real line, sequences and series of functions, uniform covergence, and the Riemann-Stieltjes integral. Prerequisites: MAT 372 or approval of instructor.

475 Differential Equations. (3) S
Asymptotic behavior of solutions of linear and nonlinear ordinary differential equations, stability, Sturm-Liouville problems, boundary value problems, singular point behavior of autonomous systems. Prerequisite: MAT 274 or equivalent.

485 History of Mathematics. (3) S
Topics from the history of the origin and development of mathematical ideas. Prerequisite: MAT 272† or equivalent.

510, 511 Point Set Topology. (3-3) F,S
Topological spaces, metric spaces, compactness, connectedness, local properties, product and decomposition spaces, mappings, covering properties, separation properties. Prerequisite: MAT 371† or 410† or approval of instructor.

543, 544 Abstract Algebra. (3-3) F,S
Groups, modules, rings and fields, Galois theory, homological algebra, representation theory. Prerequisite: MAT 444† or approval of instructor.

550 Variational Methods. (3) F
Calculus of variations and its applications to extremal problems, classical mechanics, and partial differential equations. Prerequisites: MAT 274 and MAT 462, or equivalent.

551 Linear Operators and Integral Equations. (3) S
Bounded—linear and compact operators on Hilbert spaces. Linear integral equations, Fredholm and Hilbert-Schmidt theory, approximate methods. Distributions. Prerequisites: MAT 242 and MAT 462, or equivalent.

564, 565 Advanced Numerical Analysis. (3-3) F,S
Finite difference equations, orthogonal polynomials, quadrature, approximation and integration theory, numerical solution of differential equations, numerical linear algebra. Prerequisite: MAT 464† or approval of instructor. May be repeated for credit with approval of instructor.

569 Topics in Analysis. (3) N
Prerequisite: approval of instructor. May be repeated for credit with approval of instructor.

570, 571 Real Analysis. (3-3) F,S
Lebesgue integration, selected function spaces, differentiation, abstract measure theory, elements of functional analysis. Prerequisite: MAT 372† or approval of instructor.

572, 573 Complex Analysis. (3-3) F, S
Analytic functions, series and product representations, entire and meromorphic functions, normal families, Riemann mapping theorem, harmonic functions, Riemann surfaces. Prerequisite: MAT 371† or approval of instructor.

574, 575 Theory of Ordinary Differential Equations. (3-3) N
Systems, existence proofs, singularities, asymptotic behavior of solutions, boundedness of solutions, eigenvalues and eigenfunctions, perturbation theory. Prerequisite: MAT 372† or approval of instructor.

576, 577 Theory of Partial Differential Equations. (3-3) N
Existence and uniqueness theorems, boundary value and initial value problems, characteristcs, Green's functions, maximum principle, distributions, and weak solutions. Prerequisite: knowledge of Lebesgue integration or approval of instructor.

578, 579 Functional Analysis. (3-3) N
Locally convex, normed and Hilbert spaces. Linear operators, spectral theory, and application to classical analysis. Prerequisite: MAT 472†, or 571† or approval of instructor.

591 Seminar. (1-3) N
Topics may be selected from the following:

(a) Analysis
(b) Applied Mathematics
(c) Topology
(d) Algebra
(e) Mathematical Logic
(f) Numerical Analysis
(g) Combinatorial Mathematics

Special Courses. MAT 294, 298, 492, 493, 494, 498, 499, 590, 592, 594, 598, 599, 792, 799. (See pages 35-36).

MATHEMATICS EDUCATION

MTE 180, 181 Theory of Elementary Mathematics. (3-3) F,S,SS
Number systems, intuitive geometry, elementary algebra and measurement. Intended for prospective elementary school teachers. Prerequisite for MTE 180: MAT 106 or equivalent; prerequisite for MTE 181: MTE 180 or approval of instructor.

380 Arithmetic in the Elementary School. (3) F
Historical numeration systems, overview of elementary number theory including primes, factorization, divisibility, bases, modular systems, linear congruence, and continued fractions. Prerequisite: MTE 181† or approval of instructor.

381 Geometry in the Elementary School. (3) N
Informal geometry including concepts of length, area, volume, similarity, and congruence. Classification of figures, straightedge and compass constructions, motion geometry. Prerequisite: MTE 380† or approval of instructor.

480 Mathematics in the Upper-Elementary Grades I. (3) N
An introduction to probability and statistics including open-ended data gathering and processing, counting techniques, sampling strategies, estimation, and decision making. Prerequisite: MTE 381† or approval of instructor.

481 Mathematics in the Upper-Elementary Grades II. (3) N
Elementary functions and their applications. A thorough investigation of some of the algorithms of basic arithmetic. Prerequisite: MTE 480† or approval of instructor.

482 Methods of Teaching Mathematics in Secondary School. (3) F, SS
Examination of secondary school curricular material, analysis of instructional devices. Teaching strategies, evaluative techniques, diagnosis and remediation, and problem solving. Prerequisite: approval of instructor.

483 Mathematics in the Secondary School. (3) S,SS
Topics in geometry, number theory, algebra, and analysis. Emphasis on unifying principles. Prerequisite: MAT 310† or 412† or approval of instructor.

582 Modern Mathematics for Teachers. (3) A
Theory of sets, real number system, transfinite numbers and other selected topics. Prerequisite: approval of instructor.

583 Abstract Algebra for Teachers. (3) A
Postulational approach to algebra, elementary mathematical systems including groups and fields. Prerequisite: approval of instructor.

584 Teaching College Mathematics. (3) A
Methods and learning difficulties in the teaching of instructional lower-division college mathematics courses. Prerequisite: approval of instructor.

585 Modern Geometry for Teachers. (3) A
Euclidean, projective and non-Euclidean geometries. Prerequisite: approval of instructor

587, 588 Analysis for Teachers. (3-3) N
Subject matter in mathematics appropriate for accelerated programs in secondary schools, including analytic geometry and calculus. Prerequisite: approval of instructor.

Special Courses. MTE 294, 298, 492, 493, 494, 498, 499, 590, 591, 592, 594, 588, 599, 792,799.

STATISTICS AND PROBABILITY

STP 226 Elements of Statistics. (3) F, S, SS
Basic concepts and methods of statistics, including descriptive statistics, significance tests, estimation, sampling and correlation. Not open to majors in mathematics or the physical sciences. Prerequisite: three semesters of high school algebra or MAT 106†.

326 Intermediate Probability. (3) F,S
Probability models and computations, joint and conditional distributions, moments, families of distributions. Topics in stochastic processes, simulation, and statistics. Prerequisite: MAT 210† or equivalent.

420 Introductory Applied Statistics. (3) F,S
Introductory probability, descriptive statistics, sampling distributions, parameter estimation, tests of hypotheses, chi-square tests, regression analysis, analysis of variance, nonparametric tests. Prerequisite: MAT 115† or 117† or 141† or equivalent.

421 Probability. (3) F
Laws of probability, combinatorial analysis, random variables, probability distributions, expectation, moment generating functions, transformations of random variables, central limit theorem. Prerequisites: MAT 219† or STP 326†; and 371† or equivalent.

425 Stochastic Processes. (3) S
Markov chains, stationary distributions, pure jump processes, second order processes and other topics in stochastic processes. Prerequisites: STP 421† and MAT 342†.

427 Mathematical Statistics. (3) S
Limiting distributions, interval estimation, point estimation, sufficient statistics, tests of hypotheses. Prerequisite: STP 421†.

429 Experimental Statistics. (3) S
Statistical inference for controlled experimentation. Multiple regression, correlation, analysis of variance, multiple comparisons, nonparametric procedures. Prerequisite: STP 420 or equivalent.

525 Advanced Probability. (3) N
Measure-theoretic foundations of probability, distribution functions and characteristic functions, laws of large numbers and central limit theorems, conditional probabilities, martingales, and topics in stochastic processes. Prerequisites: STP 421† and MAT 571†, or approval of instructor.

526, 527 Theory of Statistical Linear Models. (3-3) F,S
Multinormal distribution, distribution of quadratic forms, full and non-full rank models, generalized inverses, unbalanced data, variance components, large sample theory. Prerequisites: STP 427†, and knowledge of matrix algebra.

530 Applied Regression Analysis. (3) F
Method of least squares, simple and multiple linear regression, polynomial regression, analysis of residuals, dummy variables, model building. Prerequisite: STP 420† or equivalent.

531 Applied Analysis of Variance. (3) S
Factorial designs, balanced and unbalanced data, fixed and random effects, randomized blocks, latin squares, analysis of covariance, multiple comparisons. Prerequisite: STP 420† or equivalent.

532 Applied Nonparametric Statistics. (3) F
One sample tests, tests of two or more related or independent samples, measures of correlation, tests of trend and dependence. Prerequisite: STP 420† or equivalent.

533 Applied Multivariate Analysis. (3) S
Discriminant analysis, principal components, factor analysis, cluster analysis, canonical correlation. Prerequisite: STP 420† or equivalent.

534 Applied Discrete Data Analysis. (3) N
Models for discrete and count data, measures of association, log-linear and regression models for contingency tables. Prerequisite: STP 420† or equivalent.

591 Seminar. (1-3) N
Topics may be selected from the following: (a) Statistics, (b) Probability.

Special Courses: STP 294, 298, 492, 493, 494, 498, 499, 590, 592, 594, 598, 599, 792, 799 (see pages 35-36).

Military Science

(Army ROTC)

PROFESSOR:
STANDRIDGE (MAIN 240)
ASSISTANT PROFESSORS:
LAPE, SEYMOUR, SCHMITZ, SCHWARTZ, VAN DEN BELDT, PATTERSON, ERNZEN

Purpose. The Department of Military Science curriculum consists of the Basic Course (MIS 101, 102, 203, and 204) and the Advanced Course (MIS 301, 302, 401, and 402). The goal of this professional education is to prepare selected students with leadership potential to be commissioned Army officers within the national defense structure of the United States. Specific objectives include developing the leadership and managerial potential of the students; developing students' abilities to think creatively, to speak and write effectively; providing the student with an appreciation of the requirements for national security; and developing the students' understanding of the nature and functions of the U.S. Army. Upon successful completion of the Advanced Course, qualified students will receive commissions in the United States Army Reserve or Army National Guard. Active duty positions are available upon graduation from the University.

Appointments as Second Lieutenants in the Regular Army are available to outstanding students who desire a career in the military service.

General Qualifications. Male or female students entering Army ROTC must: (1) be a citizen of the United States (noncitizens may enroll but must obtain citizenship prior to commissioning); (2) be of sound physical condition; (3) be at least 17 years of age for entrance into the Advanced Course and be able to complete all commissioning requirements prior to age 30.

Four-Year Program. Students may enroll in Army ROTC during their freshman year. They take the Basic Course during the first two years, receiving a total of 8 semester hours credit for the four semesters of study. Upon satisfying the requirements stated above, they enter the Advanced Course where they will earn 10 semester hours of credit for the four semesters of study. In addition, students will attend a six-week advanced summer camp at Ft. Lewis, Washington, between their junior and senior years. Upon successful completion of the Advanced Course and requirements for a degree, they are commissioned as Second Lieutenants in the United States Army Reserve or Army National Guard.

Two-Year Program. Students must have at least two academic years of college work remaining, either at the undergraduate or graduate level. The student must also have completed a minimum of 30 hours of college credit (except for certain exceptions applicable to veterans.) This program is open to all students with the exception of three and four-year scholarship winners (see scholarships). Students seeking enrollment in the two-year program should make application during the spring semester of the year in which they desire to enter the program. They must pass the ROTC Qualifying Examination, and the Army physical examination. After successfully completing a six-week basic camp at an Army post (conducted during June, July and August) or completing the Basic Course classes during a University Summer Session (not always offered), students may enroll in the Advanced Course. Students with previous military experience, high school ROTC credit, or who are currently members of the National Guard or Reserves may be admitted directly into the two-year program. They then follow the same program and meet the same requirements as stated for Advanced Course students in the four-year program.

Qualifications for Admittance to the Advanced Course. (1) Successful completion of the Basic Course for the student in the four-year ROTC program. For the student in the two-year program, selection for and successful completion of the six-week basic summer camp. (2) Passing of the ROTC Qualifying Examination. (3) Passing the Army physical examination. (4) Attainment of the minimum cumulative grade point average required for graduation in the student's selected major for a minimum of 30 semester hours and maintenance of that minimum GPA or better as a full time student during enrollment in the Advanced Course.

Pay and Allowances. Advanced Course students receive $100 per month for the 20 months of enrollment in the Advanced Course. The student also receives one-half the pay of a second lieutenant during his attendance at the six-week advanced camp. Uniforms, housing and meals are provided

at camp without cost to the students and they are reimbursed at the current mileage rate for travel to and from the camp. Students who attend basic camp receive the pay of an Army recruit during attendance at basic camp as well as the current mileage rate for travel to and from the camp.

Simultaneous Membership Program. Under the program, ROTC students may simultaneously be a member of the Army Reserve or National Guard. The combination of advance course allowance and pay for Reserve/Guard participation provides more than $1,000 for each semester's involvement.

Scholarship Programs. The Army ROTC offers scholarship programs for outstanding young men and women who are motivated toward a career as professional officers in the Regular Army. These scholarships pay for all fees, tuition, and provide $100 per month subsistence allowance while the scholarship is in effect. In addition, a flat rate is paid each semester towards the purchase of texts and some academic supplies. A scholarship for four years is available to freshmen who will enter the four-year program. Applications must be submitted in accordance with a schedule furnished high school counselors. Selection is made on a nation-wide basis. Scholarships are available for three and two year periods commencing with the sophomore and junior years of ROTC, respectively. Applications are open to all students in good standing with the University; previous ROTC or military experience is not required for application for three and two-year scholarships. Selection is made by an interview board composed of University faculty members and Army officers in the ROTC detachment. Acceptance of any of the three scholarship programs requires a service commitment to serve in the active Army for a period of up to four years after commissioning and graduation.

Active Duty Requirements. Graduates of Army ROTC may serve as officers in the Army National Guard, Army Reserve or active Army. Active duty commitments may vary from three years to as little as three months. Scholarship students have a four-year active duty commitment.

Graduate and Professional Studies Programs. A delay from call to active duty for up to four years is available to outstanding students who desire to earn graduate or professional degrees. Special programs for graduate and professional studies are available to both Regular Army appointees and U.S. Army Reserve appointees in the following areas: medicine, osteopathy, and clinical psychology.

MILITARY SCIENCE

MIS 101 Introduction to Military Science. (2) F, SS
Organization and mission of the Army within American society; current issues in the military; military justice system; basic leadership skills. Two lecture-conferences.

102 Methods of Instruction. (2) S, SS
Learning theories and principles of instruction; development of instructor knowledge, skills, and characteristics; instructional aids; student presentations; evaluation techniques. Two lecture-conferences, 1½ hours of Leadership Practical Application.

203 Land Navigation and Survival. (2) F, SS
Components of maps; use of map and compass; orienteering and land navigation exercises; military mapping system; basic outdoor survival skills. Two lecture-conferences, 1½ hours of Leadership Practical Application.

204 Leadership and Military Management. (2) S, SS
Interdisciplinary approach to leadership and management; ethics, responsibility and conduct of military officers; effective decision-making techniques; introduction to drill and ceremonies. Two lecture-conferences, 1½ hours of Leadership Practical Application.

301 Advanced Military Science. (3) F
Theory and dynamics of the individual soldier and military units in offensive combat operations. Prerequisites: MIS 101, MIS 102, MIS 203 and MIS 204, or equivalent. Three lectures-conferences, 1½ hours of Leadership Practical Application, one two-day field exercise; three one-day field exercises.

302 Advanced Military Science. (3) S
Theory and dynamics of military units in defensive combat operations. Prerequisites: MIS 101, MIS 202, MIS 203 and MIS 204, or equivalent. Three lectures-conferences, 1½ hours Leadership Practical Application, one three-day field exercise; two one-day field exercises.

401 Advanced Military Science. (2) F
The military legal system; preparation and conduct of military training; leadership development; ethics and professionalism of the military officer. Prerequisites: MIS 301† and 302†. Two lectures-conferences, 1½ hours Leadership Practical Application, one two-day field exercise; three one-day field exercises.

402 Advanced Military Science. (2) S
Military correspondence; career planning and personal affairs in service; conduct of training; leadership development; ethics and professionalism of the military officer. Prerequisites: MIS 301† and 302†. Two lectures, 1½ hours Leadership Practical Application, one three-day field exercise; two one-day field exercises.

Philosophy

PROFESSORS:
MURPHY (PS A-521), ARNER, CARNEY, HUMPHREY, PASTIN

ASSOCIATE PROFESSORS:
BEATTY, CREATH, FITCH, GIESCHEN, GULESERIAN, LIU, WHITE

ASSISTANT PROFESSORS:
HOWELLS, MAIENSCHEIN

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Philosophy—The major in philosophy consists of 45 semester hours of credit. Thirty-six hours must be in philosophy, including 30 upper division hours, and 9 hours in related fields to be determined by the student in consultation with an advisor. Required courses are PHI 301, 302, 305, 312 or 314, 316 or 317, 333, 350, and at least two 400-level courses. Students planning to do graduate work in philosophy must consult an advisor in order to develop an appropriate selection of courses at the 300 and 400 level. A minimum grade of C is necessary for each course used to fulfill the major requirements. (See Degree Requirements, page 53.)

History and Philosophy of Science—The Department of Philosophy offers courses bearing the HPS prefix. With the consent of the Director of Undergraduate Studies, these courses may on occasion be taken to satisfy the requirements of the philosophy major. They may never be used to satisfy the related fields requirement for philosophy majors.

Departmental Graduate Program

The Department of Philosophy offers programs leading to the degree of Master of Arts that will prepare one for either teaching in a community college or pursuing a Ph.D. in philosophy. Consult the *Graduate College Catalog* for requirements.

PHILOSOPHY

Philosophy majors who take crosslisted courses must register for these under the PHI prefix.

PHI 101 Introduction to Philosophy. (3) F, S, SS
Exploration of issues which philosophers have traditionally considered: morality, reality, obligation, and knowledge.

103 Principles of Sound Reasoning. (3) F, S, SS
Fallacies, validity and soundness of arguments. May include syllogistic, elementary symbolic, inductive logic, scientific method.

111 Introduction to Moral and Social Philosophy. (3) F, S, SS
Problems of ethics and social/political philosophy: e.g., virtue and integrity, rights vs. social utility, nature of law and state.

301 History of Ancient Philosophy. (3) F
History of western philosophy from its beginnings through the Hellenistic period.

302 History of Modern Philosophy. (3) S
History of western philosophy from the Renaissance through Kant.

303 Contemporary Analytic Philosophy. (3) A
Aims and methods of such 20th century philosophers as Frege, Moore, Russell, Wittgenstein, Carnap, Ayer, Wisdom, Ryle, Austin, Strawson, Quine, and Sellars, with application to metaphysics and epistemology. Prerequisite: one course from among PHI 101, 103, 111, 301, 302, 333 or 350.

304 Existentialism and Phenomenology. (3) A
An introduction to this movement through a study of its major figures, e.g., Kierkegaard, Dostoevsky, Nietzsche, Husserl, Heidegger, Buber, Sartre, Camus, Merleau-Ponty, Binswanger, May, Frankl, and Ricouer.

305 Ethics. (3) A
Investigation of moral conduct focusing on such concepts as goodness, rightness, duty, and justice; examination of theories such as deontologism, utilitarianism, formalism, relativism, and egoism, in which these concepts occur. Prerequisite: PHI 111 or approval of instructor.

306 Applied Ethics. (3) A
Philosophical techniques are used to elucidate such vital moral issues as sexual perversion, civil disobedience, abortion, punishment, violence and pacifism, suicide, and euthanasia.

307 Philosophy of Law. (3) A
The nature and source of law and its relation to morality. Legal rights, legal enforcement of morals, civil disobedience, liability and responsibility, punishment, judicial reasoning, justice, property, differences between theories of natural and positive law.

308 Philosophy of Art. (3) A
Central problems in philosophy of art, e.g., the nature of a work of art, modern and traditional theories of art, esthetic perception and experience, objectivity and relativity in art criticism.

309 Social and Political Philosophy. (3) A
Alternative principles and methods relevant to problems of human association and conflict; justice and power, freedom and equality, autonomy and order are discussed. Prerequisite: PHI 111, 305 or approval of instructor.

311 Philosophy in Literature. (3) A
Selected works of literature introduce philosophical problems such as the nature of moral goodness and people's relation to the world and other people.

312 Theory of Knowledge. (3) A
The nature, sources, and limits of human knowledge. Theories of truth; *a priori* concepts and knowledge; empirical concepts and knowledge, perception, induction; knowledge of the external world. Prerequisite: one course from among PHI 101, 103, 111, 301, 302, 333, 350.

314 Philosophy of Science. (3) A
The structure and justification of scientific theories, explanation, and theory change. The roles of observation

and laws, theoretical concepts and entities, reduction, probability, confirmation, space and time, and causation.

315 Philosophy of Language. (3) A
Problems pertaining to the nature of language: meaning, reference, truth, definition, analyticity, translatability, synonomy, and contributions of contemporary linguistics. Prerequisite: PHI 103, 333 or 350.

316 Metaphysics. (3) A
Investigation into the real: appearance vs. reality, perception, realism vs. idealism, materialism vs. mentalism, the concepts of mind and person; substance, universals, space and time, causation. Prerequsite: one course from among PHI 101, 103, 111, 301, 333, or 350.

317 Philosophy of Mind. (3) A
Nature of consciousness. The common sense view of mind and perception, behaviorism, materialism, dualism, phenomenalism, self-knowledge, knowledge of other minds. Prerequisite: one course from among PHI 101, 103, 111, 301, 302, 333, or 350.

318 Philosophy of Religion. (3) A
Nature and justification of religious belief. Arguments for the existence of God, mysticism, theistic and pantheistic conceptions of God and creation. Prerequisite: one course from among PHI 101, 103, 111, 301, 302, 333 or 350.

319, 320 Introduction to Asian Philosophies I, II. (3,3) F, S
Leading philosophical systems of thought in Asia, especially India, China and Japan. Included are Hinduism, Buddhism, Taoism, Confucianism, and Neo-Confucianism.

325 Philosophy of Social Science. (3) A
Philosophical problems surrounding the aims, structure, and methods of theories in the social sciences.

332 19th Century Philosophy. (3) N
The history of 19th Century philosophical thought emphasizing either the German or the British traditions. Prerequisite: PHI 302.

333 Introduction to Symbolic Logic. (3) F, S
Symbolic techniques emphasizing deductions and proofs in the propositional and first and second order predicate calculi. Either axiomatic or natural deduction systems may be used.

401 Rationalism. (3) F
Examination of representative(s) of either classical or contemporary philosophical rationalism: e.g., Descartes, Spinoza, Malebranche, Leibniz, Broad, Blanchard, and Chisholm. Prerequisite: PHI 302 plus one of the following: 305, 309, 312, 316, 317.

402 Empiricism. (3) S
Examination of representative(s) of either classical or contemporary philosophical empiricism: e.g., Bacon, Hobbes, Locke, Butler, Berkeley, Reid, Hume, Mill, Carnap, Ayer. Prerequisite: PHI 302 plus one of the following: PHI 305, 309, 312, 316, 317.

413 Advanced Symbolic Logic. (3) A
Properties of formal systems axiomatizing propositional and first-order predicate logic. May also include modal logic, number theory, limits of logicism. Prerequisite: PHI 333.

420 A-E Topics in Philosophy. (3) N
Prerequisites and course descriptions on file in department. Courses may be repeated for credit. Topics may be selected from the following.

(a) Topics in Metaphysics/Epistemology
(b) Topics in Philosophy of Language/Logic
(c) Topics in Value Theory
(d) Topics in History of Philosophy
(e) Topics in Philosophy of Science

591 Seminar. (1-3) F, S
Topics may be selected from the following:

(a) Graduate Philosophy
(b) Theory of Knowledge
(c) Moral Philosophy
(d) Metaphysics and Logic
(e) History of Philosophy
(f) Epistemology
(g) Philosophy of Science
(h) Philosophy of Law
(i) Social and Political Philosophy
(j) Aesthetics

Special Courses: PHI 394, 492, 493, 497, 498, 499, 590, 592, 598, 599. (See pages 35-36.)

HISTORY AND PHILOSOPHY OF SCIENCE

HPS 201 Technology and Social Change. (2) F, S
Technology as related to social change; contemporary impact of technology on society. (Also listed as STE 201.)

321 Man and Machine. (3) F
Relation of man to machine examined in historical, political, and social terms. Comparisons with a look at artificial intelligence studies. (Also listed as STE 310.)

322, 323 Science and Technology in History. (3,3) F, S
Development and application of scientific thinking from ancient times to present. First semester through 17th century. Second semester: 18th to present. (Also listed second semester as STE 311, 312.)

402 Technology, Society and Human Values. (3) F, S
Values which motivate mankind to create technology. Areas of conflict and resolution of conflict between values and technology. Readings and discussions w/ visiting lecturers. (Also listed as STE 402.) Prerequisite: Junior standing or above.

411 Social Effects of Invention. (3) S
The role of science and invention, the private and public sector, in the development and application of technology. The issue of the personal and public responsibility of scientists and engineers is examined. (Also listed as STE 411.)

Special Courses: HPS 394, 494, 497.

Physics

PROFESSORS:
_____ (PS F-470), COMFORT, A. COWLEY, J. COWLEY, HANSON, HESTENES, JACOB, KEVANE, KYRALA, LU, NIGAM, PAGE, ROY, STARRFIELD, STEARNS, STROJNIK, TILLERY, TSONG, VOSS, WALKER, WYCKOFF

ASSOCIATE PROFESSORS:
AANNESTAD, ACHARYA, AHMADZADEH, BENIN, KAUFMANN, LINDSAY, MARZKE, SPENCE

ASSISTANT PROFESSORS:
BENNETT, BURSTEIN, RITCHIE, SANKEY, TSEN

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Physics — *Option No. 1.* Designed for students who wish to pursue physics at the bachelor or graduate degree level, this option consists of 45 semester hours of credit. Required courses are PHY 115, 116, 117, 118, 321, 322, 331, 332, 333, 334, 362, 363, 441, 465. Additional courses in physics and other related fields will be selected with the approval of the advisor. Supporting mathematics courses MAT 290†, 291 and either 274, 242 or 374, 342 are required in addition to the 45 semester hour major requirement. MAT 270†, 271, 272, may be substituted for MAT 290, 291. One year of credit in college level French, German or Russian is strongly recommended, particularly for the student who intends to pursue a graduate degree in physics.

Physics — *Option No. 2.* An interdisciplinary program designed for students who wish to obtain an undergraduate physics preparation for entry into other professions or graduate programs. Required are 45 semester hours of credit, including PHY 115†, 116, 117, 118, 321, 331, 333, 362 and 363. The remaining courses will be selected from physics and an area of concentration as approved by the student's advisor. Examples of possible areas of concentration are physical chemistry, applied mathematics, geophysics, biological physics, philosophy of science, scientific journalism, etc., as well as pre-medical and pre-law programs. Related non-major courses will necessarily include MAT 290†, 291, and 274, 242 or 342, 374. MAT 270, 271, 272 may be substituted for MAT 290, 291. One year of credit in a college level foreign language is strongly recommended for the student who wishes to pursue graduate studies in a discipline which has a foreign language requirement.

Astronomy. The astronomy faculty is a subgroup of the Physics Department. It offers General Studies courses in astronomy to the University community. Facilities of the Astronomy Group include a planetarium used for formal instruction and a rooftop observatory for student use.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

General Science—Consists of 42 semester hours of credit. Required courses are CHM 113†, 231†; PHY 111†, 112†, 113†, 114†; BOT 100; ZOL 110; GLG 472; AST 321. Electives must be approved by the general science major advisor.

Physics—*Option No. 1.* Consists of 40 semester hours of credit. Required courses are PHY 115†, 116, 117, 118 (or 111†, 112, 113, 114), 321†, 331†; PHY 460† or 361†; PHY 463† (2 hours). An additional nine hours in upper division physics (PHY) or physical science (PHS) courses will be approved by the advisor in consultation with the student. Remaining courses to complete the major may be in physics and/or closely related fields, subject to the approval of the advisor.

Physics—*Option No. 2.* A student may elect this option in conjunction with either mathematics or chemistry majors. The physics portion of this program consists of 30 semester hours, with the following courses required: PHY 115†, 116, 117, 118 (or 111†, 112, 113, 114), 321†, 331†; PHY 460† or 361†; PHY 463† (2 hours). The remaining courses to complete the 30 hours may be in physics and/or closely related fields, subject to the approval of the physics advisor.

Departmental Minor Teaching Field Requirements

Physics—Consists of 24 semester hours of credit. Required courses are PHY 115†, 116, 117, 118 (or 111†, 112, 113, 114); PHY 460 or 361†; one hour of PHY 463†. Remaining hours to complete the minor are selected from courses in physics, astronomy (upper division), and physical sciences (upper division) approved by the physics advisor.

General Science—Consists of 24 semester hours of credit. Required courses are MAT 117†; CHM 101 or 113†; PHY 101† (or 111†, 112†, 113†, 114†); AST 121 or 321; BOT 100; ZOL 110; GLG 100 or 472. Remaining hours are selected with the approval of the minor field advisor.

Physical Science—Consists of 24 semester hours of credit. Required courses are MAT 117†; CHM 101 or 113†; PHY 101 (or 111†, 112, 113, 114); AST 121 (or 321, 322); GLG 100 or 472. Electives must be approved by the physical science minor advisor.

Departmental Graduate Programs

The Department of Physics offers programs leading to the degrees of Master of Science, Master of Natural Sciences and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

Physics Department General Studies Courses for Non-Majors

All PHY, AST and PHS courses satisfy the General Studies science and mathematics requirement. The following courses presume no prior background in mathematics beyond high school algebra and geometry.

Physics: PHY 101
Astronomy: AST 121, 125, 321, 322
Physical Science: PHS 110, 361, 362, 370, 375, 380, 410, 411, 412, 413

PHYSICS

PHY 101 Introduction to Physics. (4) F, S
Emphasizes applications of physics to life in the modern world. Understanding of elementary algebra is presumed. Three lectures, 1 recitation, 2 hours laboratory.

105 Basic Physics. (4) F
One-semester survey of the principles of physics. Primarily for students who intend to take PHY 115, 116 but have not taken high school physics. Prerequisites: Algebra and trigonometry. Three lectures, 1 recitation, 2 hours laboratory.

111, 112 General Physics. (3,3) F, S, SS
Noncalculus treatment of the principles of physics for nonphysics majors. Students whose curricula require a laboratory course must also register for PHY 113†, 114†. Prerequisite: trigonometry. Three lectures, 1 recitation.

113, 114 General Physics Laboratory. (1,1) F, S, SS
Elementary experiments in physics. May be taken concurrently with, or subsequent to PHY 111†, 112†, respectively. Two hours laboratory. Outside preparation for experiments and report writing are required.

115, 116 University Physics. (4,4) F, S, SS
Principles of physics using calculus. Prerequisite: Concurrent enrollment in MAT 290†, 291†, respectively, or equivalent. For physics laboratory at this level, enroll in PHY 117†, 118†. Four lectures, 1 recitation.

117, 118 University Physics Laboratory. (1,1) F, S, SS
Introductory experiments, measurements and techniques in physics. Prerequisite: Credit or concurrent enrollment in PHY 115†, 116†. Two hours laboratory. Outside preparation for experiments and report writing are required.

321 Newtonian Mechanics. (3) F
Vector calculus. Kinematics and dynamics of particles. Conservative, resistive and central forces. Dynamics of a charged particle. Many particle systems. The two body problem and collisions. Rigid body dynamics. Motion in noninertial reference frames. Prerequisites: PHY 116†; MAT 291†, MAT 224 or equivalent; concurrent enrollment in MAT 242† or equivalent.

322 Analytical Mechanics. (3) S
Lagrange's and Hamilton's equations. Constraints. Coupled oscillators. Elements of continuum mechanics; elasticity and hydrodynamics. Prerequisite: PHY 321†.

331 Electricity and Magnetism. (4) F
Vector fields and vector calculus. Electrostatic fields. Conductors and capacitors. Currents of charge; Ohm's law, charge conservation. Circuit theory. Magnetic fields and the Lorentz force. Electromagnetic induction. Fields in matter. Displacement current. Maxwell's equations. Prerequisites: PHY 116†; MAT 242† and 274†, or equivalent.

332 Electromagnetic Fields. (4) S
Maxwell's equations. Scalar and vector potentials. Laplace's equation and boundary value problems. Magnetostatics. Electromagnetic waves; propagation in media; reflection and refraction. Prerequisite: PHY 331†.

333 Intermediate Physics Laboratory I. (3) F, S
Basic physical measurements techniques with emphasis on modern electrical and electronic instrumentation. Prerequisites: PHY 117†, 118†, 321† (or approval of instructor); MAT 274 (or equivalent). One hour lecture, 3 hours laboratory. Equivalent effort outside of the laboratory is required.

334 Intermediate Physics Laboratory II. (2) F, S
Experiments selected in consultation with instructors to suit the student's need and interests. Prerequisites: PHY 331†, 333†. Three hours laboratory. Equivalent effort outside of the laboratory is required.

351 Optics. (3) F
Matrix methods in geometrical optics; interferometry, partial coherence, selective absorbers; Fresnel and Fraunhofer diffraction; Fourier transform spectroscopy. Prerequisites: PHY 116†; MAT 291† or 272†.

361 Introductory Modern Physics. (3) F, S
Special relativity and introductory quantum theory with applications drawn from atomic, nuclear and solid state physics. Prerequisite: PHY 116†.

362, 363 Modern Physics. (3, 3) F, S
Special relativity, foundations and theoretical concepts of quantum theory; introduction to atomic, molecular, solid state and subatomic physics. Prerequisites: PHY 116†, concurrent enrollment in MAT 274† or equivalent.

401, 402 Mathematical Methods in Physics. (3) S
Elements of vector calculus, complex variables, ordinary and partial differential equations, integral transforms, special functions, determinants, matrices, probability and statistics. Prerequisite: PHY 321†.

441 Statistical and Thermal Physics I. (3) F
Statistical and experimental basis of heat, temperature and entropy. Mechanical and statistical basis of the laws of thermodynamics. Applications of macroscopic thermodynamics. Phase equilibrium. Prerequisites: PHY 321†, 331†, 363†.

442 Statistical and Thermal Physics II. (3) S
Principles and applications of statistical mechanics. Quantum statistics of ideal gases and simple solids. Equilibrium of phases and chemical species. Transport

theory. Irreversible processes and fluctuation. Prerequisite: PHY 441†.

452 Advanced Optics. (3) S
Linear systems theory, coherent and incoherent imaging, spatial filtering, elements of radio astronomy, antenna theory and heat flow problems; holography; coded apertures; reciprocity and symmetry in X-ray, electron and optical diffraction. Prerequisites: PHY 331†; 351†; PHY 401†, 402† recommended.

460 Elements of Atomic Physics. (3) N
Electron and atomic physics. Designed for teachers and students not majoring in physics. Prerequisite: one year of college physics.

462 Nuclear Physics. (3) F
Static properties of nuclei, natural and induced radioactivity, nuclear reactions, nuclear models and energy levels, mesons and hyperons, interaction of photons and electrons with matter. Prerequisite: PHY 461†.

463 Physical Measurements. (1) F
Experiments in mechanics and heat, electricity and magnetism, optics and modern physics. Designed for teachers and students not majoring in physics. Prerequisite: PHY 112†. Three hours laboratory. May be repeated for a maximum of 3 hours credit.

465 Advanced Physics Laboratory I. *(2)* F, S
Continuation of PHY 334† at a more advanced level. Prerequisites: PHY 334†, concurrent enrollment in PHY 461† (or approval of instructor). Three hours laboratory. Equivalent effort outside of the laboratory is required.

466 Advanced Physics Laboratory II. (1-3) F, S
Continuation of PHY 465. Prerequisites: PHY 465†. May be repeated for credit.

471 Quantum Mechanics. (3) F
Wave mechanics, Schrödinger's equation, barrier problems, operators and eigenfunctions, harmonic oscillator, one-electron atoms. Prerequisites: PHY 363†, MAT 274†, 242†, or approval of instructor.

472 Quantum Mechanics. (3) S
Matrix mechanics, angular momentum, perturbation theory, scattering theory. Prerequisite: PHY 471† or approval of instructor.

480 Methods of Teaching Physics. (3) S
Evaluation of various approaches to the teaching of high school physics. Preparation of demonstrations and experiments. Organization of a laboratory. Designed for secondary school physics teachers. Prerequisite: approval of instructor.

481 Solid State Physics. (3) S
Structure, elastic properties and dynamics of crystals; electron motions in crystals under applied fields. Prerequisite: PHY 363†.

495 Project Research. (1-3) F, S
Supervised project in experimental physics. Prerequisite: *four hours selected from* PHY 333†, 334†, 453† and 465†. May be repeated for credit. *Note: approval of faculty member under whose direction the work is to be done must be obtained before registration.*

501, 502 Methods of Theoretical Physics. (3,3) F, S
Provides mathematical foundations for graduate students in basic and applied physics. Complex variables, vector spaces, operators, matrices, ordinary differential equations, integral equations and transforms and special functions. May include additional topics. Prerequisites: PHY 401†, 402† or approval of instructor.

503 Physical Applications of Group Theory. (3) N
Fundamentals and applications of the theory of finite and continuous groups as they occur in physics. Atomic, molecular, solid state and elementary particle physics. Prerequisite: approval of instructor.

521 Classical Mechanics. (3) F
Variational principles, Lagrange's and Hamilton's equations; rigid body motion; canonical transformations; Hamilton-Jacobi theory. Prerequisite: PHY 321†.

522 Advanced Topics in Classical Mechanics. (3) S
Continuum mechanics; elements of hydrodynamics; elasticity theory; special relativity. Prerequisite: PHY 322†, 521†.

523 Relativity. (3) N
Special and general theories of relativity. Prerequisites: PHY 522†, 532† or approval of instructor.

531 Advanced Electricity and Magnetism. (3) F
Electrostatics and magnetostatics. Potential theory; theory of constitutive relations. Maxwell's equations. The wave equation; plane electromagnetic waves; cavities and wave guides. Prerequisite: PHY 331†, or approval of instructor.

532 Electrodynamics. (3) S
Special theory of relativity; covariant formulation of electromagnetic interactions. Inhomogeneous wave equations; Lienard-Wiechert potentials; radiation fields. Interactions of charged particles and electromagnetic waves; scattering; dispersion. Prerequisites: PHY 332†, 531† or approval of instructor.

541 Statistical Physics. (3) F
Probability theory and principles of statistical inference. Evaluating experimental data; foundations of statistical mechanics. General laws of thermodynamics from microscopic theories. Calculation of specific properties of bulk matter. Prerequisites: PHY 441†, 471† (442† desirable).

542 Advanced Topics in Statistical and Thermal Physics. (3) S
Theory of irreversible processes, Onsager-reciprocity laws, fluctuation-dissipation theorem; relaxation and transport processes in fluids and plasmas; Liouville equation; the BBGKY hierarchy of distribution functions; kinetic theory; hydrodynamics from many-body theory; phase changes and equilibrium; ferromagnetism. Prerequisite: PHY 541†.

551 X-Ray and Electron Diffraction. (3) S
Fresnel and Fraunhofer diffraction in integral formulation. Diffraction of X-rays and neutrons by crystal lattices. Structures of solids, including crystal structure analysis. Theory and techniques of electron microscopy/diffraction of *crystalline/noncrystalline* specimens. Prerequisites: PHY 451†, 481† or approval of instructor.

561, 562 Nuclear Physics. (3,3) F, S
Two nucleon interaction, Clebsch-Gordon coefficients, internucleon forces, meson theory and high energy scattering, nuclear binding energy, nuclear models, transition probability estimates, nuclear reactions, beta decay. Prerequisites: PHY 462†, 576† or approval of instructor.

568 Elementary Particle Physics. *(3)* N
Classification of particles; phenomenology of strong, electromagnetic and weak interactions, cross sections, decay rates; isotopic spin and higher symmetries; structure of reaction amplitudes. Prerequisite: PHY 577†.

569 Elementary Particle Theory. (3) N
Theoretical models for strong, electromagnetic and weak interactions; analytic-S-matrix, dispersion relations; current algebras; medium and high energy models. Prerequisite: PHY 568†.

576, 577 Quantum Theory. (3,3) F, S
Abstract approach to quantum mechanics in Hilbert space; observables and their corresponding operators, eigenstates and eigenvalues; quantum dynamics; approximation methods; systems of identical particles; an-

gular momentum and group representation theory; collision processes; relativistic quantum theory. Prerequisites: PHY 471†, 521†.

578, 579 Relativistic Quantum Theory. (3,3) F, S
Relativistic one-particle equations, Klein-Gordon equation, Dirac equation, second quantization, theory of scattering, S-matrix, Feynman diagrams, quantum electrodynamics, renormalization procedures. Prerequisite: PHY 577†.

581 Solid State Physics. (3) F
Quantum theory of solids including phonons, lattice specific heats, band structure models, Fermi surfaces, thermal expansion, plasmons, electron-phonon interactions and scattering by lattice defects. Prerequisites: PHY 481†, 472†, 576† (or concurrent enrollment).

582 Solid State Physics. (3) S
Elements of transport theory, thermal conduction, electronic conduction in metals, mobility in semiconductors, Hall effect, magnetoresistance and selected topics of current research. Prerequisite: PHY 581†.

595 Current Physics Literature. (1) N
Weekly seminar to introduce the graduate student to current activity in physics through the contemporary literature. (May be repeated for credit.)

ASTRONOMY

AST 121 20th Century Astronomy. (3) F, S, SS
Earth as a planet, the solar system, stars, galaxies and cosmology. Intended for nonscience majors. Three lectures, observatory and planetarium experience.

125 Introduction to Observational Astronomy. (2) F, S
Telescope and interpretation of astronomical observations. Photographic and planetarium experience. Prerequisites: Understanding of elementary algebra and credit or concurrent enrollment in AST 121 or 321 or 322 or approval of instructor. One hour lecture, 2 hours laboratory. Outside preparation for experiments and report writing is required.

321 Discovering the Solar System. (3) F, SS
History of astronomy, astronomical instruments, motions of the moon and planets, the sun and planets, birth and death of the solar system. Prerequisite: high school algebra. Three lectures, observatory and planetarium experience. Outside preparation for experiments and report writing is required.

322 Stars and the Universe. (3) S
Distances to stars, formation and evolution of stars, galaxies and the universe. Prerequisite: high school algebra. Three lectures, observatory and planetarium experience.

351 The Solar System. (3) N
Spherical and gravitational astronomy, planets, comets, origin of the solar system. Prerequisites: PHY 116†; MAT 242† and 274†.

352 Stellar Astronomy. (3) N
Stellar distance scales, photoelectric photometry, interstellar matter, stellar dynamics, binaries, variable stars, galaxies, and cosmology. Prerequisites: PHY 116†; MAT 242† and 274†.

421 Stellar Astrophysics. (3) N
The physics of stellar atmospheres, identification of stellar spectra, stellar structure and evolution. Prerequisites: PHY 321†; MAT 242† and 272†.

422 Interstellar Astrophysics. (3) N
Physics of the interstellar medium, gas and dust clouds, interstellar molecules, gaseous nebulae, magnetic fields, cosmic rays. Prerequisites: PHY 321†; MAT 242† and 274†.

PHYSICAL SCIENCE

PHS 110 Physical Universe. (4) S
The universe as a unit; stars, solar system, earth, and atoms. Nature of matter and energy. Three lectures, 2 hours laboratory. Outside preparation for experiments and report writing is required.

361, 362 Science and Man. (2,2) F, S
Effects upon man of his technological civilization and consideration of recent advances in both pure and applied physical sciences. PHS 361: mechanics, electromagnetic radiations and astronomy. PHS 362: geology, chemistry and nuclear energy. Courses may be taken in either order.

370 Ideas of Physics. (1-3) N
Relationships of physical concepts to other areas of knowledge. Recent offerings have been: (1) basic concepts in physics; relativity, complementarity, uncertainty, etc.; (2) current topics of research and public interest; (3) methods for developing and assessing new ideas. See *Schedule of Classes* and consult Physics Department for current titles and sectional offerings. May be repeated for credit.

375 The Energy Crisis. (2-3) F, S
Current problems in energy resources, production, consumption and conservation. No physics or mathematics prerequisites. Students registered for 3 hours will participate in a discussion group as well as attend lectures.

380 Strategy and Tactics in Science. (2-3) N
Basic principles and procedures for constructing scientific models. Conservation, symmetry, and causality principles. Isolation, control, and estimation of variables. Examples from science and application to everyday situations.

410 Origins of the Physical Sciences. (3) N
Origins of astronomy, chemistry, physics and mathematics in the cultures of Mesopotamia, Egypt, China and India.

411 Development of the Physical Sciences. (3) N
Hellenistic mathematics, physics, chemistry and astronomy. Arabs and the physical sciences; their role in spreading the physical sciences to Europe. The development of the physical sciences in Europe until the time of Newton.

Special Courses: PHY, PHS, AST 294, 298, 484, 492, 493, 494, 497, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

Political Science

PROFESSORS:
McGOWAN (SS 410), ALISKY, BERMAN, HINK, JO, JONES, KAMINSKY, KIRKPATRICK, MASON, MILLER, RICE, SIMON, WHITE

ASSOCIATE PROFESSORS:
ASHLEY, DAGGER, DALGLEISH, DANTICO, McGAW, MUSHKATEL, READER, STOOKEY, WALKER, WATSON, WILSON, WOLF, YOUNGBLOOD

ASSISTANT PROFESSORS:
KEATING, RASLER

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Political Science—Consists of 45 semester hours of credit of which 30 must be in political science and 15 in closely related fields to be approved by the advisor in consultation with the student. At least 15 hours in political science must be in upper division courses. Required courses are POS 110 or 300; 150 or 160; 301; and one from among 440, 441, 442, 443, 445 or 446.

Students who major in political science must have a 2.0 average for all courses which count toward the major. Upper division courses which count toward the major must have "C" grades or better; no more than one "D" grade in a lower division course may be counted in the major. (See Foreign Language Requirement, page 53.)

Latin American Studies Combined Degree Program. (See Interdisciplinary Studies, page 59)—Consists of the Bachelor of Arts degree requirements in political science. At least 30 upper division semester hours of the total program must be in Latin American content courses including 15 hours in political science and 15 in other disciplines. A reading knowledge of Spanish or Portuguese is required. A reading knowledge of the other language is suggested. The program must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a Bachelor of Arts degree with a major in Political Science—Latin American Studies Emphasis.

Asian Studies Emphasis (see Interdisciplinary Studies, page 57)—Consists of the Bachelor of Arts degree requirements in political science plus a minimum of two years of Chinese or Japanese. Thirty semester hours of the total degree program must consist of Asian Studies courses selected with the approval of the advisor. Fulfillment of these requirements will be recognized by a Bachelor of Arts degree with a major in Political Science—Asian Studies Emphasis.

Bachelor of Science Degree Curriculum

Political Science—Consists of 36 semester hours of credit in political science; 15 in closely related fields to be approved by the advisor in consultation with the student; and 6-9 hours in a sequence of supporting courses. At least 21 hours in political science must be in upper division courses. Required courses in political science are POS 110 or 300; 150 or 160; 301; 401; and one from among 440, 441, 442, 443, 445 or 446. The required supporting courses consist of a sequence from one of the three following groups: MAT 119, 210, 242, 243, 270, or 290, together with its appropriate prerequisite; PHI 103 or 333, and one from among 314, 325, or 413; or CSC 100†, and one from among 181, 183, 304, or 305.

Students who major in political science must have a 2.0 average for all courses which count toward the major. Upper division courses which count toward the major must have "C" grades or better; no more than one "D" grade in a lower division course may be counted in the major. (See Degree Requirements, page 53.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Political Science—Consists of 45 semester hours of credit, 30 of which must be in political science and 15 in closely related fields. Six courses are required: POS 110 or 300; 150 or 160; 301; 417; one from among 440, 441, 442, 443, 445 or 446; and 480.

Students who major in political science must have a 2.0 average for all courses which count toward the major. Upper division courses which count toward the major must have "C" grades or better; no more than one "D" grade in a lower division course may be counted in the major.

Departmental Minor Teaching Field Requirements

Political Science—*Consists of* 24 semester hours of credit in political science courses. Six courses are required: POS 110 or 300;

150 or 160; 301; 417; one from among 440, 441, 442, 443, 445 or 446; and 480.

Students who minor in political science must have a 2.0 average for all courses which count toward the minor. Upper division courses which count toward the minor must have "C" grades or better; no more than one "D" grade in a lower division course may be counted in the major.

Departmental Graduate Programs

The Department of Political Science offers programs leading to the degrees Master of Arts and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

POLITICAL SCIENCE

POS 101 Political Ideologies. (3) F, S
Leading political ideas and belief systems, *e.g.*, Marxism, liberalism, conservatism, theories of democracy, and alternative futures.

110 Government and Politics. (3) F, S
Major institutions of modern government and processes of individual and group political activity with emphasis on the American experience. Meets the federal government requirement for teacher certification. Not open to students with credit for 300.

120 Political Issues and Public Policy. (3) F, S
Contemporary social problems and political issues, particularly development of public policy.

150 Comparative Government. (3) F, S
Political institutions and processes in selected foreign countries: origins, strengths and weaknesses of contemporary political systems, political development.

160 Global Politics. (3) F, S
The nature of contemporary world politics through the study of both general theoretical topics and specific geographical areas.

170 American Legal System. (3) F, S
Concepts, institutions, classifications and functions of law. The role of the courts and the impact of judicial decision-making on social change.

300 American National Government. (3) F, S
Powers, functions and agents of American political institutions. Meets the federal government requirement for teacher certification. Not open to students with credit for POS 110.

301 Empirical Political Inquiry. (3) F, S
Logic of political inquiry including research problems, concepts, hypotheses, theories, measurement, data collection and analysis.

311 Arizona Constitution and Government. (2) F, S
Constitution and government of the State of Arizona. Not open to students having credit for POS 316, 411 or 417. Meets the Arizona government requirement for teacher certification. May not be counted for the major, teaching major or minor in political science.

313 The Congress. (3) A
Lawmaking process in the U.S. Congress.

314 The American Presidency. (3) A
Office, role, and power of the American presidency in the American political system.

315 The Supreme Court. (3)
Role of the Supreme Court in American society and politics; examination of decision making process, impact of decisions; restraint versus activism.

316 State and Local Government. (3) A
Survey of the operations, problems, and policies of state and local governments in the U.S.

320 Public Administration. (3) A
Role of the administrator in the political process with an examination of the basic concepts of bureaucracy.

325 Public Policy Development. (3) A
Relationships between policy development and administrative processes as affected by the various roles of legislative bodies, executive and administrative agencies.

330 Current Issues in National Politics. (3) A
Major issues facing national governments in the domestic field. May not be counted for the major or the teaching major in political science.

331 Public Opinion. (3) A
Formation, expression, and influence of individual and organized opinion on political institutions.

332 American Political Parties. (3) A
Development of the American party system. Party organization and functions.

333 Interest Groups. (3) A
Examines how minority, corporate, labor, farm, consumer, environmental, health, education, and public interest groups, and single issue movements influence government.

334 Comparative Politics. (3) A
Theoretical approaches and political institutions, such as parties, pressure groups, legislatures, and executives, from a cross-national perspective.

336 Electoral Behavior. (3) A
Voting behavior and the attitudes, perceptions, and activities of the citizenry in the political process.

349 The British Nations. (3) A
Examines such parliamentary systems as Great Britain, Ireland, Canada, Australia, and New Zealand.

356 Western Europe. (3) A
Structures and behavior of governmental institutions and political processes in selected countries of Western Europe.

360 Current Issues in International Politics. (3) A
An analysis of major current problems in world politics. May not be counted for the major or the teaching major in political science.

361 American Foreign Policy. (3) A
United States in world affairs; foreign policy since World War I. Techniques in formulating American foreign policies.

401 Political Statistics. (3) A
Basic concepts in statistics as they facilitate the description, explanation, and prediction of social and political phenomena.

410 Urban Government and Politics. (3) A
Governmental organizations, decision-making structures, and problems of urban political systems.

413 Comparative Legislative Processes. (3) A
Lawmaking process followed in selected legislative bodies; composition of membership, organization, powers; impact of internal and external forces on legislation.

417 The Arizona Political System. (3) F, S
Contemporary political problems within the context of Arizona's political, social, and constitutional frameworks. Meets the Arizona Constitution requirement for certification.

422 Politics of Bureaucracy. (3) A
Bureaucracy as a political entity; internal dynamics of public agencies; the relationship between public agencies and other political entities.

423 Politics of Budgeting. (3) A
The policy process in budgeting; strategies used to influence this process and recent reforms in public budgeting.

424 Regulatory Politics. (3) A
Development and implementation of governmental policies regulating business activity, *e.g.*, anti-trust, consumer and environmental protection and labor relations.

426 Elements of Public Policy. (3) A
Each section may cover one of the following topics: consumer protection, natural resources, criminal justice, environmental protection, science and technology, or theories of public policy. May be repeated for credit when topics vary.

438 Revolution and the Social System. (3) A
Causes and consequences of revolution. Identification of systemic structures and institutions conducive to radical and moderate patterns of conflict resolution.

439 Minority Group Politics in America. (3) A
Role of minority groups in American politics.

440 History of Political Philosophy I. (3) A
Western political philosophers and their theories to the 17th century.

441 History of Political Philosophy II. (3) A
Western political philosophers and their theories from the 17th to the 20th century.

442 American Political Thought. (3) A
Political theories and movements from the colonial period to the present.

443 Topics in Contemporary Political Theory. (3) A
Major problems and theories in contemporary political thought.

445 Asian Political Thought. (3) A
Contemporary political ideas and theories in selected Asian countries, including the impact of Marxist and non-Marxist theories on revolutionary processes.

446 Problems of Democracy. (3) A
Issues and problems in democratic theory: *e.g.*, the nature of democracy, majority rule, representation, equality, and the value of political participation.

448 China, Japan, and the Koreas. (3) A
A comparative analysis of the political modernization experiences of China, Japan, and the two Koreas, focusing on their differing reactions to the West.

450 Soviet Union and Eastern Europe. (3) A
Description and analysis of political institutions and practices in the Soviet Union and the Communist-governed nations of Eastern Europe.

452 China. (3) A
Background of the Communist revolution, political processes and developmental problems in China from a comparative perspective.

453 South America. (3) A
Governmental institutions, political processes and developmental problems of the South American states.

454 Mexico. (3) A
Mexican federal, state and local governmental institutions.

455 Central America and the Caribbean. (3) A
Governmental institutions, political processes and developmental problems of the nation-states and dependent areas of Central America and the Caribbean.

458 Southeast Asia. (3) A
Political background, governmental institutions, political dynamics and developmental problems of Southeast Asian nations.

459 Sub-Saharan Africa. (3) A
Governmental institutions and processes of politics south of the Sahara.

460 World Politics. (3) A
Theoretical examination of one or more aspects of international politics, *e.g.*, foreign policy, negotiations, alliances, crises, wars, international systems.

462 Soviet Foreign and Defense Policies. (3) A
Examination and analysis of foreign and defense policies of the Soviet Union.

463 Inter-American Relations. (3) A
Diplomatic relations among the Latin American states. Development of U.S. foreign policy toward Latin America.

464 American Defense Policy. (3) A
Problems and issues of the organization and control of the defense establishment of the U.S.

465 International Organization and Law. (3) A
History, practical political significance, and future of international institutions, transnational regimes, and international law.

467 Comparative Defense Policy. (3) A
Problems and issues of the organization and control of effective defense establishments within the context of various political systems.

468 Comparative Asian Foreign Policies. (3) A
Foreign policies of the Asian states emphasizing their security relations and movements toward regionalism.

470 Law and Society. (3) A
Nature, purposes and sanctions of law; sources of law; private and public law; common and civil law. Courts and administration of justice.

471 Constitutional Law I. (3) A
Development of the United States Constitution as reflected in decisions of the Supreme Court; jurisdiction and organization of the federal courts; judicial review; separation of powers; federalism; the commerce clause; national taxing and spending power; state police power.

472 Constitutional Law II. (3) A
Development of the United States Constitution as reflected in decisions of the Supreme Court: Due process; equal protection of laws; individual rights; civil liberties.

476 Political Economy. (3) A
Problems, policies, and possibilities of various political-economic systems and the interrelationship of capitalism, socialism, and democracy.

477 International Political Economy. (3) A
Contending approaches to historical and contemporary issues of international political economy, including global welfare, equality, ecology, and peace.

480 Methods of Teaching Government. (3) A
Methods of instruction, organization and presentation of subject matter in political science. Prerequisites: SED 311† or concurrently, and 15 hours in political science or approval of instructor.

484 Internship. (1-6) A; except Legislative Internships (12) S

494 Special Topics in Political Science. (3) A
Chosen from the various fields of political science.

498 Pro-Seminar. (3) A
Small group study and research for advanced students within their major area. Prerequisite: major in the department or approval of instructor.

501 Foundations of Political Action. (2) F (8 weeks)
Examines the creation and expansion of political issues, mobilization of publics, and relationships among

legislators, bureaucrats and lobbyists in various policy sectors. Prerequisite: approval of instructor.

502 Political Evaluation. (2) F (8 weeks)
Examines the political and philosophical bases for the assessment of political action. Prerequisite: approval of instructor.

503 Applied Political Inquiry. (3) S
Basic research design, methods, and statistics applied to problems in various policy sectors. Prerequisite: approval of instructor.

591 Seminar. (3) A
(a) American Politics
(b) Global Politics
(c) Public Policy
(d) Political Theory

598 Topics. (3) A
(a) American Politics
(b) Global Politics
(c) Public Policy
(d) Political Theory

601 Advanced Experimental Research. (3) F
The implementation of experimental and quasi-experimental research designs as models of inquiry and as applied in political research, including laboratory techniques and topics in the analysis of variance. Prerequisite: POS 401 or equivalent.

602 Advanced Survey Research. (3) S
Problems in the design and conduct of political surveys, including sampling, instrument design, scaling, and statistical and graphical analysis of survey data. Prerequisite: POS 401 or equivalent.

603 Polimetrics I. (3) F
Applications of the general linear model to topics in the estimation of single equation models of political phenomena including time-series analysis. Prerequisite: POS 401 or equivalent.

604 Polimetrics II. (3) S
Continuation of POS 603, including techniques of simultaneous equation estimation and other multi-variate statistical techniques such as factor and discriminant analysis. Prerequisite: POS 603.

792 Research. (3) F, S
Projects in various areas of political science. Required of all, and open only to, doctoral students.

Special Courses: POS 294, 394, 492, 493, 499, 590, 592, 599, 790, 792, 799. (See pages 35-36.)

Psychology

PROFESSORS:
PARKINSON (PSY B-237C), BRAUN, CIALDINI, HAYGOOD, JONES, KAROLY, KILLEEN, LANYON, LINDER, MEYERSON, REICH, VESTRE

ASSOCIATE PROFESSORS:
BARRERA, BRAVER, CHARTIER, CHASSIN, EISENBERG, FEHR, GLANZMAN, HOMA, KENRICK, LESHOWITZ, LEVINE, LINDHOLM, ROSSI, SADALLA, SANDLER, SOMERVILLE, WEST, ZAUTRA

ASSISTANT PROFESSORS:
DAMOS, HARRIS, PRESSON, WOLCHIK

INSTRUCTOR:
RITCHIE

Departmental Major Requirements

The Department of Psychology maintains an Undergraduate Advisement Office staffed by trained personnel. All psychology majors are required to meet with an undergraduate advisor once each semester for approval of the student's choice of courses. Failure to do so may prevent graduation at the expected time. It is the responsibility of the student to make appointments with an undergraduate advisor.

Bachelor of Arts Degree Curriculum

Psychology—Consists of 45 semester hours of which 28 must be in psychology, including at least 15 upper division hours, and the remainder in related fields to be approved by an undergraduate advisor. Required courses, which must be passed with a minimum grade of "C", are PGS 100, PSY 230, PSY 290; one from among PSY 323, 324, 325; one from among PGS 315, 341, 350; and one additional upper division PSY course. The additional upper division courses to complete the 15 hour requirement may include no more than a total of 3 hours in PGS 399, PGS 499, and PSY 499 combined. Required related courses are MAT 117† and one from among CSC 100†, 180, 181, 183†; MAT 119 recommended. See page 53 for the Foreign Language Requirement.

Bachelor of Science Degree Curriculum

Psychology—Consists of 53 semester hours of which 31 must be in psychology, including at least 15 in upper division courses, and the remainder in related courses approved by the undergraduate advisor. Required courses, which must be passed with a minimum grade of "C", are PGS 100, PSY 230, PSY 290; one from among PSY 323, 324, 325; one from among PGS 315, 341, 350; and one additional upper division PSY course. The additional upper division courses to complete the 15 hour requirement may include no more than a total of 3 hours in PGS 399, PGS 499, and PSY 499 combined. Required related courses are MAT 117† and 119, or MAT 115† and 270; one course from among CSC 100†, 180, 181, 183†; two semesters of physical sciences (physics, chemistry, geology, astronomy); and two semesters of life sciences (biology, zoology, physiology, microbiology).

Departmental Minor Teaching Field Requirements

(Secondary Education)

Consists of 24 semester hours of credit taken in consideration of the prerequisites listed for courses.

Departmental Graduate Programs

The Department of Psychology offers programs leading to the degree of Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

PSYCHOLOGY (PGS)

Courses which may be applied toward General Studies requirement in social and behavioral sciences.

PGS 100 Introduction to Psychology. (3) F, S, SS
Major areas of theory and research in psychology. Participation in department-sponsored research or an educationally-equivalent alternative activity is required.

241 Adolescence Psychology. (3) N
Topics in both normal development (e.g., self-concept, peer relationships) and disorders of adolescence (e.g., anorexia, suicidal behavior, substance abuse). Prerequisite: PGS 100.

270 Psychology of Adjustment. (3) F, S, SS
Principles of mental health, adjustment, conflict, stress and coping processes derived from clinical and experimental research. Intended for non-majors; cannot be used for major credit. Prerequisite: PGS 100.

306 Environmental Psychology. (3) F, S, SS
Concepts and research strategies in the study of behavior in interaction with physical environment. Prerequisite: PGS 100.

315 Personality Theory and Research. (3) F, S, SS
Definition and description of personality in terms of theoretical and methodological approaches. Prerequisite: PGS 100.

331 Sexual Identification. (3) N
Theories and research in the development of sexual identification; concepts of femininity and masculinity; social roles and attitudes. Prerequisite: PGS 100.

332 Human Sexual Behavior (3) F, S
Patterns of sexual behavior including variations and deviations; theories of sexual attraction, sex differences, and sexual dysfunction and treatment. Prerequisite: PGS 100.

341 Developmental Psychology. (3) F, S
Behavior development analyzed in terms of psychological principles. Current research in human development. Prerequisite: PGS 100.

350 Social Psychology. (3) F, S, SS
Human social behavior including such concepts as aggression, attraction, attribution, conformity, groups, helping, person perception, and persuasion. Prerequisite: PGS 100.

351 Interpersonal Influence. (3) F, S
Principles and procedures that affect the process of social influence; consideration of attitudinal, compliance inducing, and perceptual influences. Prerequisite: PGS 350.

365 Community Psychology. (3) F, S
Mental health and psychological well-being in the community emphasizing current issues and related research. Prerequisite: PGS 315† or 350†.

399 Supervised Research. (1-3) F, S, SS
Experience within the context of current faculty research projects. Student is assigned responsibility depending on qualifications. Prerequisites: approval of faculty member prior to registration, "B" average in major, PSY 230† or equivalent (may be taken concurrently). Y grade only; may be repeated for a total of 6 hours.

414 History of Psychology. (3) F, S
Historical development of psychology from its philosophical beginnings to the present. Prerequisite: PGS 100.

427 Psychology of Aging. (3) N
Behavioral, experiential, and emotional phenomena associated with aging. Analysis of retained abilities and resources as well as losses and stresses. Prerequisite: PGS 315† or approval of instructor.

430 Industrial Psychology. (3) F, S, SS
Organizations and management systems; motivation and work performance; human factors in systems design and evaluation; personnel selection and testing. Prerequisite: PGS 100 or MGT 301.

441 Cognitive Development. (3) F, S
Experimental and theoretical literature in child development and behavior. Prerequisite: PGS 341† or approval of instructor.

442 Life Span Development. (3) N
Methods and findings of recent studies of the development, growth and problems of adolescents and adults with implications for education. Prerequisite: PGS 341†.

443 Abnormal Child Psychology. (3) F, S
The major disorders of childhood and adolescence, (e.g., autism, hyperactivity, phobias, delinquency) are covered including cause, diagnosis, treatment and prevention. Prerequisites: PGS 100 and one course from among PGS 310, 315, 341, 350 or approval of instructor.

444 Directed Child Study. (1-3) F, S, SS
Supervised experience with children in the pre-school program of the Child Study Laboratory. Prerequisites: CDE 232† or PGS 341† and approval of instructor. May be repeated for a total of 9 credits.

445 Child Language and Drawing. (3)
Language acquisition and developmental changes in drawing, considered in the context of cognitive developmental stages. Children's representation and communication of knowledge through language and drawing. Prerequisite: PGS 341.

458 Group Dynamics. (3) F
Theories and methods of group leadership, group effectiveness, communication within groups and relations between groups and individual members. Prerequisite: PGS 350†.

459 Attitudes and Attitude Change. (3) S
Concept of attitude. Review of theory and research including techniques of measurement. Analysis of attitude change at both mass and individual levels. Persuasive communication, balance models, cognitive, perceptual and motivational determinants. Prerequisite: PGS 350†.

466 Abnormal Psychology. (3) F, S, SS
Historical and current definitions, theory, and research concerning abnormal behavior. Major categories of psychopathology including related treatment approaches. Prerequisites: PGS 270 and PGS 315†.

471 Personnel Testing. (3) S
Methods and theory of psychological testing; various types of psychological tests; consideration of ethical, social, and legal aspects of testing. Prerequisites: PGS 100, one course in statistics, PGS 430† or MGT 311.

472 Clinical Psychology. (3) F, S
Clinical psychology as a science and profession. Historical development, methods of interviewing, assessment, and therapeutic intervention. Prerequisite: PGS 466†.

Special Courses: PGS 394, 494, 498, 499. (See pages 35-36.)

PSYCHOLOGY (PSY)

Courses which may be applied toward the General Studies requirement in sciences and mathematics.

PSY 212 Experimental Analysis of Behavior. (4) F, S
Basic principles of behavior analysis, with emphasis on the control and modification of human behavior. Course is self-paced; includes a laboratory.

230 Introduction to Statistics. (3) F, S, SS
Basic concepts in descriptive and inferential statistics, emphasizing applications to psychology. Prerequisite: PGS 100; MAT 117† is recommended. The course has both self-paced (PSI) and lecture sections.

290 Experimental Psychology. (4) F, S
Planning, execution, analysis and reporting of experiments. Literature, procedures and instruments in representative areas of psychological research. Prerequisite: PSY 230† or equivalent. Three lectures, 3 hours laboratory.

323 Sensation and Perception. (3) F, S
Underlying processes of vision, audition and the other senses. Application of current research and theory in a laboratory environment. Prerequisite: PSY 290† or approval of the instructor.

324 Learning and Memory. (3) F, S, SS
Processes underlying information storage and retrieval, including different kinds of memory, forgetting, depth of processing, and control processes. Prerequisite: PSY 290† or approval of instructor.

325 Physiological Psychology. (3) F, S, SS
Relationships of physiological processes to behavior. Emphasis is on nervous system functioning. Prerequisites: PSY 290†, or two courses in biological science and approval of instructor.

330 Statistical Methods. (3) S
Advanced application of statistics to psychology. Highly recommended for students interested in attending graduate school. Prerequisite: PSY 230†. Three lectures, 1 hour laboratory.

399 Independent Study. (1-3) F, S, SS
Design and execution of original research projects under faculty supervision. Prerequisite: approval of instructor. May be repeated for a total of 6 hours.

420 Radical Behaviorism. (3) N
Research, applications, and philosophy of the control of human and animal behavior from the Skinnerian perspective. Prerequisite: PSY 212 or 290†.

425 Biological Bases of Behavior. (3) N
Critical study of physiological psychology; brain mechanisms underlying motivation, learning, etc. Prerequisite: PSY 325†.

426 Neuroanatomy. (4) N
Structure and function of mammalian brain including sheep brain dissection. Prerequisite: PSY 325† or equivalent. Three lectures, 3 hours laboratory.

432 Human Performance. (3) S
Analysis of human behavior in complex human-machine systems, including tracking, vigilance, scanning and failure detection. Prerequisites: PSY 290† and upper division standing, or approval of instructor.

433 Human Psychophysiology. (3) S
Emphasis on human physiological-behavioral relationships. Topics include physiological change associated with imagery, stress, attention, skill learning, lying, and biofeedback. Prerequisite: PSY 325†.

434 Cognitive Psychology. (3) S
The human organism as a processor of information, from perception to cognition. Abstract concepts, semantic memory, attention, and mental imagery. Prerequisite: PSY 323† or 324† or approval of instructor.

437 Human Factors. (3) F
Emphasis on human factors in high technology systems. Specific topics include systems development, systems analysis techniques, displays and controls. Prerequisites: PSY 290† and upper division standing, or approval of instructor. (Same as IEE 437.)

470 Psychopharmacology. (3) F, S
Basis of drug action at physiological and behavioral levels. Psychological and medical applications and limitations of drugs used in the treatment of mental illness. Prerequisites: One semester each of biology and chemistry; or PSY 325†.

490 Course Programming. (2) F, S,
Supervised experience in the development and administration of programmed instruction. Designed for students who proctor self-paced or personalized courses. May be repeated for a total of 4 credits. Prerequisite: PSY 212 or 230† and approval of instructor. May be repeated for a total of 4 hours.

501 Supervised Teaching. (4) F
Experience in and examination of perspectives on teaching undergraduate psychology. Prerequisites: graduate standing in Psychology and approval of instructor.

506 Survey of Research in Environmental Psychology. (3) F
Major topics and paradigms in the study of man-environment relationships.

512 Advanced Learning. (3) N
Principles and theories of learning, emphasizing research literature.

522 Methods and Instrumentation in Psychological Research. (3) N
Electronic and electromechanical instrumentation in psychological research, including training in the programming and use of real time computers. Prerequisite: approval of instructor.

524 Advanced Physiological Psychology. (3) N
Contributions of physiological processes and brain function to fundamental behavioral processes.

528 Sensation and Perception. (3) N
Principles of sensory and perceptual processes, emphasizing research literature.

529 Correlation and Psychometric Theory. (3) S
Principles of correlational techniques, including regression and multiple correlation. Psychometric theory, including reliability, and validity.

530 Intermediate Statistics. (3) F
Continuation of PSY 529. Psychological statistics, emphasizing the analysis of variance and the design of experiments.

534 Information Processing. (3) N
Processes by which sensory input is transformed, reduced, elaborated, stored, recovered, and used.

535 Cognitive Processes. (3) N
Theoretical/empirical treatment of the human organism as a processor of information, including abstraction, memory structure, problem solving, and thinking.

541 Research in Cognitive Development. (3) N
Theoretical and empirical issues in the study of children's knowledge and cognitive processes. Comparison of research in Piagetian and other traditions. Prerequisite: Admission to Psychology Ph.D. program or approval of instructor.

550, 551 Advanced Social Psychology. (3, 3) F, S
Theory and research concerning interpersonal perception, decision-making, attitude formation and change, group processes, social motivation, and interaction processes. Prerequisite: approval of instructor.

553 Social Influence. (3) N
Research literature relevant, for example, to attitude formation and change, conformity, obedience, power, compliance and altruism. Prerequisites: PSY 550†, 551†, or approval of instructor.

555 Experimental and Quasi-Experimental Designs for Research. (3)
Review of research techniques. Laboratory and field research analyzed; applications to specific topics. Prerequisite: approval of instructor.

556 Social Perception. (3) N
Theoretical and empirical implications of topics in social perception and cognition, e.g., attribution, attraction, impression formation. Prerequisites: PSY 550 and 551 or approval of instructor.

558 Interpersonal Processes. (3) N
One or more topics chosen from: empathy, modeling, vicarious processes, contagion, group phenomena, social communication, behavior exchange. Prerequisites: PSY 550†, 551†, or approval of instructor.

564, 565 Somatopsychology. (3, 3) N
Theory and research in the psychological aspects of chronic illness, physical disability, and mental retardation.

569 Advanced Study of Personality. (3) N
Personality as a theoretical concept in psychology, including definitional problems, behavioral and traditional approaches, the measurement of personality, and current research issues. Prerequisite: approval of instructor.

572 Personality Assessment. (3) S
Theory and research on assessment of personality and psychopathology and construction of personality assessment instruments. Supervised practice in a self-paced instructional format. Prerequisite: admission to clinical Ph.D. program or approval of instructor.

573 Psychopathology. (3) F
Theory and research relating to the contribution of psychological, social, physiological, and genetic factors to the development and persistence of abnormal behavior. Prerequisite: admission to Psychology Ph.D. program or approval of instructor.

574 Psychotherapy. (3) S
A detailed survey of the theoretical and empirical literature relating to verbal psychotherapy and interviewing methods. Structured role-playing practice in the major procedures. Prerequisite: admission to the clinical Ph.D. program or approval of instructor.

575 Behavior Therapy. (3) F
Theory and research relating to the use of behavior therapy in modifying abnormal behavior. Structured practice. Prerequisite: admission to the clinical Ph.D. program or approval of instructor.

576, 577 Clinical Practicum. (3, 3) F, S
Supervised experience in development of professional skills in clinical psychology including the application of assessment procedures, psychotherapy, and behavior therapy techniques with children and adults, and consultation. Prerequisite: admission to clinical Ph.D. program.

579, 580 Community Psychology Practicum. (3, 3) F, S
Supervised experience in conceptualizing, conducting and evaluating psychological interventions to promote well-being in community settings. Advanced theory and research as relevant. Prerequisite: PSY 582 and advanced standing in psychology Ph.D. program or approval of instructor.

582 Community Psychology. (3) SS
Community systems, intervention techniques, consultation models, history and current status of community mental health movement, conceptualization of the roles of community psychologists in social system intervention. Prerequisite: advanced standing in Psychology Ph.D. program or approval of instructor.

583 Child Psychopathology. (3) N
Major theories and research related to the development of deviant behaviors in children, including some supervised experience in child assessment. Prerequisites: PSY 572†, or approval of instructor.

584 Advanced Treatment Methods. (3) N
Advanced theory, research, and techniques of psychological treatment methods. Prerequisites: PSY 576†, 577†, and approval of instructor.

588 Consultation Methods. (3) N
Several theories and strategies of organizational consultation. The development of consultational skills through simulation and practical experience. Prerequisite: advanced standing in Psychology Ph.D. program or approval of instructor.

589 Social Learning Theory. (3) N
Social-learning approach to the study of adaptive and maladaptive behavior patterns, including theoretical and empirical research foundations of behavior therapy strategies. Prerequisite: admission to Psychology Ph.D. program or approval of instructor.

591 Seminar. (3) F, S, SS

Special Courses: PSY 394, 494, 498, 499, 584, 590, 592, 599, 700, 791, 792, 799. (See pages 35-36.)

Religious Studies

PROFESSORS:
WENTZ

ASSOCIATE PROFESSORS:
MARTIN (LL B-605), FELDHAUS, FOARD, GEREBOFF, MORRISON

ASSISTANT PROFESSORS:
CADY, SCHREINER

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

The major in religious studies consists of 45 semester hours of credit. Thirty hours must be in religious studies (including 21 upper division hours) and 15 hours in related fields. In order for the student to become acquainted with a variety of religious phenomena, as well as with major issues and methods in the study of religions, the 30 semester hours in religious studies must

include: REL 305; at least one course in religions from each of three distinct geographic regions or cultural traditions; and two research seminars, including REL 405. (REL 405 may be repeated for credit.) All majors must plan their programs in consultation with a departmental advisor. A minimum grade point average of 2.5 is required in the 30 hours of religious studies courses (see Foreign Language Requirement, page 53.)

Departmental Graduate Program

The Department of Religious Studies offers programs leading to the degree of Master of Arts for those who wish to seek the Ph.D. in the study of religions, or who wish to teach at the community college level, or for those in non-academic careers who desire general competence in the academic study of religions. Consult the *Graduate College Catalog* for requirements.

RELIGIOUS STUDIES

REL 100 Religions of the World. (3) F, S
An introduction to religious traditions of the world, including Buddhism, Hinduism, Islam, Judaism, Christianity, and others.

210 Introduction to Judaism. (3) A
The beliefs, ceremonies, festivals and institutions of Judaism emphasizing the contemporary era. The course presupposes no previous knowledge about Judaism.

270 Introduction to Christianity. (3) A
The beliefs, ceremonies, festivals and institutions of Christianity, emphasizing the contemporary era. The course presupposes no previous knowledge about Christianity.

305 Ritual, Symbol, and Myth. (3) A
Ritual, symbol, and myth as types of religious expression with examples selected from the non-literate religions of the world.

310 Western Religious Traditions. (3) A
Religious traditions of Judaism, Christianity, and Islam, comparing their doctrinal, institutional, and ritual systems and social histories.

315 Hebrew Bible (Old Testament). (3) A
The nature, content, background, historical situation and message of the books of the Hebrew Bible, in English translation.

316 Types of Early Judaism. (3) A
Developments in Judaism during the inter-testamental period.

317 Introduction to Rabbinic Judaism. (3) A
An historical analysis of the thought, literature, and institutions of rabbinic Judaism.

320, 321 Religion in America. (3, 3) F, S
The emergence of religious ideas and institutions. REL 320 up to the Civil War; REL 321 from the Civil War to the present.

330 Native American Religious Traditions. (3) A
World views and religious thought presented through the art, architecture, literature, music, mythology, ritual, and folklore of representative tribes in North America.

331 History of Native American Religious Traditions. (3) N
The role of religion in Native American history including missionization, religious adaptation; prophetic, messianic, and religious revitalization movements.

340 Confucianism and Taoism. (3) A
Issues in classical Chinese religious thought. Readings include Confucius, the *Tao Te Ching*, Mencius, Chuang Tzu, and the *I Ching*.

350 Hinduism. (3) A
The study of diverse forms of Hinduism through its institutions, literature, folklore, art, and architecture.

351 Buddhism. (3) A
Doctrines, practices, and institutions of the Buddhist religion, emphasizing its role in the history and culture of Asian societies.

365 Islamic Civilization. (3) A
An interdisciplinary survey of the art, history, and religion of Islamic civilization.

371 New Testament. (3) A
Origins and literature of early Christian communities; historical investigations of the types of oral and written tradition in the New Testament.

372 Formation of the Christian Tradition. (3) A
Origins, development and expansion of Christianity; major themes and tensions from the New Testament world to the beginning of the Middle Ages.

374 Classics of Christian Literature. (3) N
The interaction of Christian thought and culture as seen in representative Christian literature of various ages (early Christian to contemporary).

381 Religion and Moral Issues. (3) A
The manner in which human religiousness relates to social concerns; e.g., sexuality, the environment, bioethical issues, and violence.

385 Contemporary Religious Thought. (3) A
Issues in current Western religious thought, such as theology and revolution, Judaism and Christianity, the impact of science on religion, the "death of God" controversy, the Bible and tradition.

390 Women and Religion. (3) A
The role of women in several organized religions and/or religious sects, including a study of myth and symbols as they are used to establish, maintain, and enforce sex-roles within specific religions.

405 Problems in Religious Studies. (3) A
Selected topics and methodological problems in religious studies, involving students in the research interests of the instructor. May be repeated for credit when topics vary.

410 Judaism in Modern Times. (3) N
Variety of expressions of Judaism and Jewishness in the modern period. Topics may include American Judaism or religious responses to the Holocaust.

415 The Jewish Mystical Tradition. (3) A
Examination of some of the esoteric lore of Judaism. Movements and literature such as Hasidism and Kabalah will be studied.

420 Religion in American Life and Thought. (3) A
The influence of religion on American society, culture, and ideas; the distinctive character of religion in America. Prerequisite: REL 320/321 recommended.

426 American Preachers and Preaching: The Sermon in America. (3) N
The life and work of notable American preachers. The emergence of the preacher as representative of American religion. Prerequisite: REL 320 or 321 recommended.

427 American Religious Thought. (3) N
The thought of representative American religious thinkers, i.e., Jonathon Edwards, William Ellery Channing, Horace Bushnell, and Reinhold Niebuhr. Prerequisite: REL 320/321 recommended.

435 Problems in Native American Religions. (3) A
An in-depth consideration of selected problems in Native American religions.

443 Zen. (3) A
History, practices and cultural influence of Zen (Ch'an) Buddhism in China and Japan.

444 Religion in Japan. (3) A
Role of religion in Japanese history and culture. Emphasis on the impact of Buddhism and its transformation in Japan, the vitality of folk religion, the intimacy of religion and the arts, the ideals of the samurai and religion in modern Japan.

454 Hindu Religious Thought. (3) A
Readings in classical systems, such as Samkhya and Vedanta, and in the works of modern Hindus, such as Aurobindo and Gandhi. Prerequisite: REL 351 recommended.

460 Studies in Islamic Religion. (3) A
Issues in the interpretation and understanding of Islamic texts, history, society, culture, and rituals. Prerequisite: REL 365 or Religious Studies major or consent of instructor.

464 The Islamic Mystical Tradition. (3) N
Asceticism, mysticism, and the cult of the saint in Islamic society; implications for Islamic religious and social history. Prerequisites: REL 365 or Religious Studies major or consent of the instructor.

470 Religion in the Middle Ages. (3) A
Religious aspects of medieval life and thought; variety of forms of dissent, heresy, and reform movements (4th to 13th centuries).

471 Reformation and Modern Christianity. (3) A
Protestant Reformation to contemporary Christian movements; includes factors in the dissolution of the Medieval Christian synthesis, variety of reform movements and reformation patterns, Catholic counter-reform measures, formation of liberal theology, ecumenical movement, World Council of Churches.

485 Existentialist Theology. (3) N
The contribution of existentialist thinkers, especially Kierkegaard, to the work of theologians such as Martin Buber, Rudolf Bultmann, and Paul Tillich.

486 Critiques of Religion. (3) A
Major theories and critiques of religion among modern social, philosophical, and religious thinkers.

494 Special Topics in Religious Studies. (3) N
Open to all students, freshmen by approval of instructor only. Topics may be selected from various areas.

498 Pro-Seminar in Religious Studies. (3) A
For students with a major or minor emphasis in Religious Studies.

591 Seminar. (3) N
Topics on methodological issues in the study of religion. Prerequisite: Religious Studies graduate student or approval of instructor.

598 Special Topics. (3) F, S
May be repeated for credit. Topics are selected from the following areas:

(a) Study of Religion, Comparative Religion
(b) Comparative Western, Ancient Near East, Judaism
(c) Religion in America
(d) Native American Religion
(e) Religion in East Asia
(f) Religion in South Asia
(g) Islam
(h) Christianity, Greco-Roman Religion
(i) Western Religious Thought, Ethics
(j) Problems in Religious Studies

Special Courses: REL 294, 298, 394, 492, 493, 497, 499, 500, 583, 584, 590, 592, 593, 594. (See pages 35-36).

Sociology

PROFESSORS:
GORDON (SS 321), AXELROD, FARBER, HUDSON, LINDSTROM, MAYER, OWEN, PFUHL, SEBALD

ASSOCIATE PROFESSORS:
COBAS, HARDERT, LANER, MILLER, NAGASAWA, SMITH, SNOW, SULLIVAN, WEITZ, WHITAM

ASSISTANT PROFESSORS:
BENIN, KULIS, THOMAS

Departmental Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

Sociology—Departmental requirements are the same for the Bachelor of Arts and for the Bachelor of Science degrees; see the College of Liberal Arts section of this catalog for the additional requirements for B.A. and B.S. degrees. The departmental requirement for either degree consists of 45 semester hours of credit of which 30 must be in sociology and 15 in closely related fields to be approved by the advisor in consultation with the student. The 30 hours must include SOC 101 or 301, 390, 391, 483 or 485 or 486 and one course from at least three of the following five areas: institutional forms and processes, demography and ecology, social problems, social organization and social psychology (details available in the department office). At least 18 semester hours must be in upper division courses. (See Degree Requirements, page 53.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Sociology—Consists of 63 semester hours of credit of which 30 hours must be in sociology and are exactly those courses required for the Bachelor of Arts or Bachelor of Science degree in sociology. Of the remaining hours, two groups of 12 hours each and one

of 6 hours are generally taken in related social sciences plus SED 480†.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Sociology—Consists of 24 semester hours of credit, at least six of which will be upper division. SOC 101 or 301 is required. The remaining 21 hours must be approved by the sociology advisor in consultation with the student, and must include at least one course from at least three of the following five areas: institutional forms and processes, demography and ecology, social problems, social organization and social psychology (details available in the department office).

Special Emphasis Program

Public Safety Emphasis—A public safety emphasis is available for law enforcement and fire fighting personnel in either the Bachelor of Arts or Bachelor of Science major in sociology. The 30 hours must consist of SOC 340†, 360, 440, 446, 449, and SWU 470† in addition to SOC 101, 390†, 391, 483 or 486 or 485. Applicable courses taken outside the Department of Sociology may be used to meet the requirement of 15 hours in closely related fields approved by the advisor in consultation with the student. Upon graduation, those successfully completing the program will receive recognition by a statement on the student's transcript.

Departmental Graduate Programs

The Department of Sociology offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

SOCIOLOGY

SOC 101 Introductory Sociology. (3) F, S, SS
Fundamentals of sociology, organization of human groups and society, processes of interaction and social change. Not open to students who have credit for SOC 301. Two hours lecture, one hour discussion.

301 Principles of Sociology. (3) F, S, SS
Intensive and critical analysis of the concepts of sociology. Not open to students who have credit for SOC 101.

305 Courtship and Marriage. (3) F, S, SS
A functional approach to marriage; courtship, engagement, marital adjustment.

332 The Modern City. (3) F, S
Growth, characteristics and problems of the modern city. Prerequisite: SOC 101 or 301.

333 Population Problems. (3) F,S, SS
Theories of population change; births, deaths, migration; population policies. Prerequisite: SOC 101 or 301.

340 Sociology of Deviant Behavior. (3) F, S, SS
Introduction to and analysis of deviant behavior. Delineation of the sociological and social psychological factors which give rise to deviant behavior such as suicide, drug addiction, homosexuality, prostitution, etc. Prerequisite: SOC 101 or 301.

341 Modern Social Problems. (3) F, S, SS
Race relations, poverty, unemployment and other current issues.

348 Overview of Aging. (3) F
Multidisciplinary introduction to gerontology. Explores the characteristics, experiences, problems, and needs of older persons.

351 Industrial Sociology. (3) S
Social and cultural analysis of industry. Occupational roles, status and social participation of workers. Prerequisite: SOC 101 or 301.

352 Social Change. (3) F, S
Patterns of social change, resistance to change and change-producing agencies and processes. Prerequisite: SOC 101 or 301.

360 Sociological Psychology. (3) F, S
Interaction patterns between the sociocultural order and individuals; socialization process; norms, roles and statuses; collective behavior. Prerequisite: SOC 101 or 301.

361 Variant Sexuality. (3) F
Sociological research and theories dealing with homosexuality, transvestism, transsexualism and other variations in sexual orientation and gender identity. Prerequisite: SOC 101 or 301.

362 Sociology of Adolescence. (3) F, S
Cultural values and the social processes that help explain the development of the phenomenon of modern adolescence, including investigation of adolescent subcultures and cross-cultural references.

365 The Sociology of Mass Communication. (3) F, S
A sociological exploration of the major mass media as a communicative process in American society.

390 Social Statistics I. (3) F, S, SS
Application of descriptive and inferential statistical methods to research problems in sociology. Prerequisites: SOC 101 or 301 and passing a proficiency examination in basic algebra to be administered by the Department of Sociology, or approval of instructor. MAT 106† recommended.

391 Sociological Research. (3) F, S, SS
Methods of sociological research, including the fundamental assumptions underlying research, and some practical experience in research design, data collection techniques and data analysis. Prerequisites: SOC 101 or 301, 390† or approval of instructor.

392 Practicum in Survey Research I. (3) F
Provides practical experience in conducting a significant research project—survey design, questionnaire construction, sampling, data collecting, coding and preliminary data processing. Prerequisite: SOC 391† or approval of instructor.

393 Practicum in Survey Research II. (3) S
Continuation of SOC 392. Provides practical experience in analysis and reporting survey data. Prerequisite: SOC 392†.

401 Comparative Sociology. (3) F
Cross-cultural study of basic social institutions; methodology of cross-cultural research; case studies of three or four different societies, concentrating on one other than the United States. Prerequisites: six hours in sociology including SOC 101 or 301, or ASB 102, or approval of instructor.

410 Sociology of Religion. (3) S
Interrelationship of culture, society and religion; religion and social stratification; religion and economic and political institutions; social change and religion. Emphasis on American society and institutions. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

415 The Family. (3) F, S, SS
The family considered from the institutional viewpoint; its historical development, and its adaptation to a changing culture; the family system in many cultures. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

416 Marriage Problems in Contemporary Society. (3) S
Marital and family problems in today's society from the viewpoint of personal and cultural adjustment. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

417 Family Violence. (3) F
Current research and theory on child abuse, neglect, sexual exploitation, and maltreatment; also spousal abuse and violence; intervention; policies.

432 Human Ecology. (3) F, S
Patterns and laws of societies' adjustments to the physical environment; distribution of communities and institutions. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

433 Demography. (3) S
Science of population analysis; problems in measurements of the size, composition and changes in population. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

440 Racial and Ethnic Minorities. (3) F, S, SS
Problems of minorities in the United States and in other racially and ethnically heterogeneous societies. Evaluation of theories of prejudice and of research dealing with discrimination, desegregation and assimilation. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

446 Sociology of Crime. (3) F
The process of criminalization, exploring the behavior of the definers of crime and the behavior of those defined as criminals. Prerequisites: SOC 101 or 301 and 340†, or approval of instructor.

448 Sociology of Aging. (3) F, S
Social aspects of aging. Theoretical and methodological perspectives, problems of aging such as life satisfaction, retirement and adjustment to role loss. Prerequisite: SOC 101 or 301 or approval of instructor.

449 Sociology of Law. (3) S
Examination of law as an institution; its origins, operations, and consequences. Emphasis on contemporary legal issues and problems. Prerequisite: SOC 446† or approval of instructor.

452 Sociology of Complex Organizations. (3) F
Sociological studies of government agencies, industrial firms, labor unions, military establishments and other large-scale organizations. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

453 Social Class and Stratification. (3) S
Social classes and the function of these groupings in a society. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

454 The Afro-American in Modern Society. (3) S
Social and cultural heritage of Black Americans; achievements and current trends. Prerequisite: approval of instructor.

455 Collective Behavior. (3) S
Social causes and consequences of such non-institutionalized forms of behavior as crowds, cults, publics, social movements and revolutions. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

456 Political Sociology. (3) S
Social factors associated with voting behavior; the nature and structure of the electorate and political parties, and the nature of national and international power structure.

457 Sociology of Health and Illness. (3) F
Social aspects of physical and mental illness, and sociological analysis of the health care system and its practitioners. Prerequisite: SOC 101 or 301, or approval of instructor.

462 Social Control. (3) F
Significance of social control in society, and the various methods used by individuals and groups to control others. Prerequisite: SOC 360† or approval of instructor.

464 Women's Roles. (3) S
Sociological analysis of the development, nature, and consequences of traditional and alternative roles of women in contemporary society. Prerequisite: SOC 101 or 301, or approval of instructor.

483 History of Social Thought. (3) S, SS
Social thought in human culture. Background of modern sociology. Prerequisites: six hours in sociology including SOC 101 or 301, or approval of instructor.

485 Sociology of Knowledge. (3) F
Relationship between social conditions and the development of knowledge in modern society. Prerequisite: SOC 101 or 301, or approval of instructor.

486 Contemporary Theory. (3) S
Contemporary issues and crises in social theory with major focus on particular theorists. Ideological factors in theory, philosophical issues, the nature of theory and its relationship with methodology. Prerequisite: SOC 101 or 301, or approval of instructor.

498 Pro-Seminar. (3) F, S
Topics to be selected.

501, 502 Practicum in Survey Research. (3, 3) F, S
A one-year research practicum in survey field work, analysis, and reporting in the Phoenix Area Study. Prerequisite: SOC 391†.

505 Social Statistics II-Multivariate Analysis. (3) F, SS
Analysis of variance, multiple regression, dummy variable regression, path analysis and related topics. Computer application to problem solving. Prerequisite SOC 390† or equivalent, and a proficiency examination. Enrollment in MAT 530 is encouraged.

507 Social Statistics III: Advanced Multivariate Analysis (3) S
Computer application in sociology. Topics such as discriminant function analysis, factor analysis, canonical correlation, advanced multiple regression, and structural equation models are studied through the application of computers. Prerequisite: SOC 505 or approval of the instructor. Enrollment in MAT 533 is encouraged.

515 Studies of the Family. (3) S
Current developments in the study of marriage and the family. Prerequisite: approval of instructor.

585 Development of Sociology. (3) F
Major sociological theorists, including Durkheim, Weber, Marx, Parsons, Merton, Dahrendorf, Homans, Mead. Prerequisite: approval of instructor.

586 Contemporary Sociological Theory. (3) S
Analysis of major theories, including structural-functional, conflict, social exchange, symbolic interaction, role theory. Prerequisite: approval of instructor.

587 Metasociology. (3) S
Nature of sociologial assumptions. Nature and form of sociological theories. Context of discovery-grounded theory. Context of justification. Prerequisite: approval of instructor.

591 Seminar. (1-3) F, S

595 Methodological Issues in Sociology. (3) S
Basic methodological issues in the application of scientific methods to the study of human social life. Emphasis on limited number of major works, with contrasting approaches to issues. Prerequisite: SOC 391† or approval of instructor.

Special Courses. SOC 298, 484, 492, 493, 494, 497, 499, 500, 590, 592, 599, 700, 780, 791, 799. (See pages 35-36.)

Speech and Hearing Science

PROFESSORS:
LaPOINTE (LL A-129A), CLUFF, DORMAN, MOWRER, PRATHER

ASSOCIATE PROFESSORS:
CASE, CHUBRICH

ASSISTANT PROFESSORS:
HANNLEY, LEEK

LECTURER/CLINICAL SUPERVISORS:
EHRET, KENNEY

CLINICAL DIRECTOR:
WHALEY

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Speech and Hearing Science—The Bachelor of Science degree consists of a minimum of 45 semester hours of credit emphasizing the developmental and scientific aspects of language, speech and hearing. The following courses, or their approved equivalent, are required: SHS 105 or 305, 310, 311, 316, 320, 367, 375, 395, and 465. Remaining courses, to complete the 45-hour requirement, may be selected from a list of approved electives available through the department.

Departmental Graduate Program

The Department of Speech and Hearing Science offers a program leading to the degree of Master of Science and Master of Natural Science. Consult the *Graduate College Catalog* for requirements.

SPEECH AND HEARING SCIENCE

SHS 105 Introduction to Speech and Hearing Science. (3) F, S
The normative and disordered processes of human communication.

305 Survey of Communication Disorders. (3) F, S, SS
Survey of evaluation and treatment of individuals with communication disorders.

310 Anatomy and Physiology of Speech. (3) F

311 Anatomy and Physiology of Hearing. (3) F, S
Prerequisites: MAT 117 and 118 or MAT 115.

316 Introduction to Hearing Impairment. (3) S
Prerequisites: SHS 311, SHS 320.

320 Hearing Science. (3) F, S
Neurophysiological and psychoacoustic behavior of the auditory system. Prerequisite: SHS 311.

367 Language Acquisition in Early Childhood. (3) F, S
Process of language development in the normal child from birth through preschool.

375 Speech Science. (3) S
Normative aspects of speech, hearing, and language. Prerequisite: SHS 310, 311.

395 Modifying Communicative Behavior. (3) F
Principles and techniques of modifying speech and language behavior. Prerequisites: PSY 212; SHS 105 or 305.

396 Disorders of Phonology. (3) S
Detailed analysis of disorders of articulation. Prerequisites: SHS 105 or 305, 310 and 395.

400 Methods of Audiometry. (4) F
Techniques and instrumentation used in measuring auditory threshold and audiogram interpretation. Three hours lectures, 2 hours laboratory weekly. Prerequisites: SHS 311, 316, 320.

425 Acoustic Phonetics. (3) F
Memory and perception of speech and language. Prerequisites: SHS 310, 311, and 320.

430 Psychology of Hearing-Handicapped Children. (3) N
Effects of hearing impairment on child language acquisition, intellectual development, personality development and educational placement.

432 Aural Rehabilitation—Children. (3) S
Theories and practices in the education of hearing-handicapped children.

435 Noise and Society. (3) S
Effects of noise on individuals and communities and practical solutions to noise problems. Prerequisite: SHS 320.

450 Observation. (1) F, S
Supervised observation of evaluation and therapy representing the areas of language, speech, and hearing. Prerequisite: approval of instructor.

465 Child Language Acquisition. (3) F

490 Child Language Disorders (3) F
Introduction to the nature and treatment of language disorders in children. Prerequisites; SHS 310, 311; 367 or 465; 395.

502 Advanced Audiology. (3) F
Procedures in differential diagnosis of auditory pathologies. Prerequisite: SHS 400.

504 Aural Rehabilitation: Hearing Aids. (3) F
Operation and application of amplifying devices relative to the aurally handicapped. Prerequisite: SHS 400.

506 Physiological Measurements (3) S
Theory and application of physiological techniques for assessing the auditory system. Three hours lecture, one hour laboratory. Prerequiites: SHS 502 or 510.

508 Pediatric Audiology. (3) S
Audiologic testing, and management of young children and infants. Prerequisite: SHS 400.

510 Advanced Hearing Science. (3) F
Psychoacoustic and psychophysiological correlates of audition. Prerequisites: SHS 311, 320.

520 Disorders of Fluency. (3) F
Development and nature of stuttering.

521 Treatment of Disorders of Fluency. (2) S
Prerequisites: SHS 520 and approval of instructor.

527 Evaluation: Audiometric Measurement. *(1-6)* F, S, SS
One staffing and two hours client contact per week per hour of credit. May be repeated for credit. Prerequisite: approval of instructor.

531 Neurophysiology of Hearing. (3) N
The neurophysiological processes of hearing. Prerequisites: SHS 311, 320.

540 Differential Diagnosis. (3) F, S
Procedures for assessing speech/language disorders in children and adults. Three hours lecture, 2 hour laboratory. Prerequisite: approval of the instructor.

541 Evaluation: Differential Diagnosis. (1-3) F, S
Two hours supervised client contact per week per hour of credit. May be repeated for credit. Prerequisite: approval of instructor.

545 Speech Perception and Production. (3) F
Current progress in production and perception of speech. Prerequisite: SHS 375 or approval of instructor.

551 Therapy: Practicum. (1-6) F, S, SS
Supervised practicum in communication disorders. May be repeated for credit. Prerequisite: approval of instructor.

564 Internship in Communication Disorders. (1-6) F, S, SS
Off-campus directed experiences in speech pathology, language disorders, or hearing disorders. May be repeated for credit. Prerequisite: approval of department; student must reserve enrollment by early registration.

565 Child Language Development. (3) S
Recent advances in the study of child language development. Not open to students with credit in SHS 465.

566 Psychology of Language. (3) N
Language and thought in interaction.

575 Neurological Disorders of Speech—Aphasia. (3) F
Assessment of communication disorders related to brain injury.

576 Neurological Disorders of Speech—Cerebral Palsy. (3) S
Communication disorders related to cerebral palsy; asessment and treatment.

577 Orofacial Disorders of Communication—Cleft Palate. (3) S
Communication disorders related to anomalies of the orofacial structures. Prerequisite: SHS 310 or approval of instructor.

578 Disorders of Voice. (3) F
Communication disorders related to dysfunction of the phonatory and resonance systems of voice production, assessment and treatment. Prerequisite: SHS 310 or approval of instructor.

584 Internship in Communication Disorders. (1-6) F, S, SS
Off-campus directed experiences in speech pathology, language disorders, or hearing disorders. May be repeated for credit. Prerequisite: approval of department; student must reserve enrollment by early registration.

591 Seminar. (3) F, S, SS
Selected topics regularly offered.

Special Courses: SHS 294, 298, 484, 492, 493, 494, 497, 498, 500, 580, 584, 590, 592, 593, 598, 599. (see pages 35-36.)

Women's Studies

The Women's Studies Program is an interdisciplinary university program, housed in the College of Liberal Arts. Core and affiliated faculty hold tenure or tenure-track positions in traditional academic departments. Information on faculty affiliation is provided in parentheses for reference.

PROFESSORS:
CORBIN (Health & Physical Ed.), GIFFIN (History), JOHNSON (Justice Studies), KELLY (Public Affairs), MAGENTA (Art), McHUGHES (Communication), NILSEN (Educational Technology), SHAFER (Secondary Education), K. B. VALENTINE (Communication), WARNICKE (History)

ASSOCIATE PROFESSORS:
ALLISON (Leisure Studies), BRANDT (Anthropology), COOK (Management), DANTICO (Political Science), DATESMAN (Justice Studies), EDELSKY (Elementary Education), EISENBERG (Psychology), GREENE (English), LOSSE (Foreign Languages), METHA (Secondary Education), ROTHSCHILD (History), SHINN (English), WEITZ (Sociology)

ASSISTANT PROFESSORS:
FUCHS (History), GRUZINSKA (Foreign Languages), JURIK (Justice Studies), NIGG (Hazards Studies), C. VALENTINE (Communication)

Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

Women's Studies—The major consists of twelve (12) required credits in Women's Studies and thirty-three (33) elective credits distributed across Women's Studies and related fields. At least 27 of the 45 credits required for the major must be completed in upper division courses.

Students must complete WST 100, WST 498, and an upper division course which provides an historical perspective on the lives and contributions of women. This latter requirement may be fullfilled by completing HIS 370, HIS 371, HIS 422, FRE 431, or an approved special topics course. Students must complete an upper division course on women in non-western societies,

or a course on minority or ethnic women in American society; a list of approved courses is available each term in the Program Office.

Electives in Women's Studies—Students must complete 1-5 elective courses in Women's Studies; at least nine hours in upper division Women's Studies courses must be completed for the degree.

Electives in a Single Discipline—Majors must complete 6-10 courses in a discipline other than Women's Studies; this amounts to the completion of the minimum core requirements in a single field other than Women's Studies. These courses may be used to satisfy the general education requirements in the College of Liberal Arts. In exceptional cases, a student may be permitted to focus courses from more than one Department. A student must secure approval for such a program of study through a petition.

Requirements for the B.A. degree

A student must demonstrate foreign language competence equivalent to two years of college level course work.

Requirements for the B.S. degree

Students must complete six hours in statistics, computer science, or quantitative research methods. This sequence must be approved by the student's advisor.

Certificate Program in Women's Studies

The Certificate Program is equivalent to an interdisciplinary minor. Students majoring in another field may wish to have a minor area concentration in Women's Studies. (Refer to page 62 for a description of the Certificate Program.)

WOMEN'S STUDIES

WST 100 Women and Society. (3) F, S
Interdisciplinary introduction examining critical issues in Women's Studies.

294 Special Topics. (3)
Topic variety by semester; check with Program Office for current description.

300 Women in Contemporary Society. (3) N
Intensive interdisciplinary examination of such topics as: Gender roles, work education, sexuality, politics, health and law. Not open to students who have credit for WST 100.

484 Undergraduate Internship. (1-6)
Advance approval of Program Director required.

494 Special Topics. (3)
Topics vary by semester; advance approval of Program Director required.

498 Proseminar: Theoretical Issues in Women's Studies. (3) S
Reading and research on important theoretic issues in Women's Studies.

499 Independent Study. (1-6)
Topic agreed on in advance by instructor and student; approval of Program Office required.

590 Readings and Conference. (1-6)
Topic arranged in advance between student and instructor; approval of Program Office required.

591 Seminar. (1-6)
Topics vary by term; contact Program Office for current listing.

598 Special Topics. (1-6)
Topics vary by term; contact Program Office for current information.

The following courses are available through the department. Refer to department listing for a course description.

ARE 485 Women's View of Art
ASB 211 Women in Other Cultures
CED 591 Woman: Sense of Identity
COM 308 Women and Communication
CRJ 422 Women and Crime
CRJ 560 Women and Crime
ENG 461 Women and Literature
FRE 431 French Women in Society and the Arts
HIS 370 Women in U.S. History: 1600-1890
HIS 371 Women in U.S. History: 1890-1980
HIS 422 Social History of American Women
HUP 316 Women and the Humanities
HUP 315 Asian Women
PGS 331 Sexual Identification
REL 390 Women and Religion
SOC 417 Family Violence
SOC 464 Sociology of Sex Roles
SPF 515 Education of Women

Additional courses will appear as special topics; these will vary by semester. Check with the Program Office, or the Department for a current listing.

Zoology

PROFESSORS:
CHURCH (LS C-226), ALCOCK, ALVARADO, DOANE, HADLEY, HAZEL, McGAUGHEY, MINCKLEY, OHMART, PATTERSON, RASMUSSEN, WOOLF

ASSOCIATE PROFESSORS:
COLLINS, FISHER, FOUQUETTE, GOLDSTEIN, JUSTUS, LAWSON, RUTOWSKI, SMITH, WALSBERG

ASSISTANT PROFESSORS:
CAPCO, CHANDLER, FAETH, GALAT, MARTIN, MOORE, RISSING, SATTERLIE

LECTURER:
MILSTEIN

PROFESSORS EMERITI:
BENDER, CAZIER, CLOTHIER, COLE, GERKING, HASBROUCK, LANDERS, STAHNKE

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Biology—A combined offering by the faculties of the Departments of Botany-Microbiology and Zoology. This major serves students desiring a broader program in the biological sciences than provided by the more specialized majors of the individual departments. The major consists of 63 hours, including 43 hours in biological sciences and 20 hours in supplementary areas, plus a mathematics proficiency. Required major courses (31 hours) are BIO 181, 182, 320, 340; BOT 300; MIC 201 or 210; MIC 202; ZOL 350; BOT 360 or ZOL 360; the remaining 13 hours are to be selected so the total major hours reflect a balance between the two departments. Required supplementary courses are CHM 113, 115; CHM 231 (or CHM 331, 332, 335, 336); PHY 101 (or PHY 111, 112, 113, 114); CSC 181 or 183.

Mathematics proficiency requirement: MAT 115 (or MAT 117, 118) and 210 (or any calculus). One year of a foreign language, or equivalent competence (see Degree Requirements, page 53.)

Zoology—Consists of a minimum of 61 hours in major and supplemental courses, plus mathematics proficiency. Required are: BIO 181, 182, 320, 340, 445; ZOL 280, 330, 331, 360, plus one of ZOL 270 or 350 or 354; CHM 113, 115, and either of the following sequences: CHM 331, 332, 335, 336, or CHM 231, 261; PHY 111, 112, 113, 114; CSC 181, or 183. Mathematics proficiency requirement: MAT 115, 210 (or MAT 270, 271, 272, or MAT 290, 291 may be substituted for MAT 210). One year of a foreign language, or equivalent competence (see Degree Requirements, page 53.)

Wildlife Biology—Two options are available:

The *Wildlife Management Option* consists of a minimum of 70 hours in major and supplemental courses, plus mathematics proficiency. Required are: BIO 181, 182, 217, 320, 340, 415; ZOL 270, 360, 411, 412, and ZOL 354 or 471 or 472; BOT 307; ERA 370 (or 360); an additional, approved upper division Plant course (BOT or ERA); CHM 113, and CHM 115 or 116; CHM 231 (or CHM 331, 332, 335, 336); CSC 181 or 183; COM 225. Mathematics proficiency requirement: MAT 115, 210 (or MAT 270, 271, 272, or MAT 290, 291 may be substituted for MAT 210).

The *Fisheries Management Option* consists of a minimum of 60 hours in major and supplemental courses, plus mathematics proficiency. Required are: BIO 181, 182, 217, 320, 340, 415, 426; ZOL 270, 350, 360, 413, 473; CHM 113, CHM 115 or 116, CHM 321; COM 225. Mathematics proficiency requirement: MAT 115, 210 (or MAT 270, 271, 272, or MAT 290, 291, may be substituted for MAT 210).

These requirements meet the minimum for eligibility for the Federal Register. Students planning to enter graduate school from either option should take CHM 331, 332, 335, 336 instead of CHM 231, and should take PHY 111, 112, 113, 114.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Biological Sciences—A combined offering by the faculties of departments of Botany-Microbiology and Zoology. The major consists of a minimum of 42 hours of credit, plus at least 9 hours in supporting courses. Required major courses are BIO 181, 182, 320, 340; BOT 300 or 370; BOT 360; MIC 201 or 210; MIC 202; ZOL 350, 360. The remaining courses in the major (7 hours minimum) must include one from each of the two departments. Required supporting courses are: CHM 113, 115. BIO 480 is re-

quired in the professional education program.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Biological Sciences—Consists of 24 semester hours as follows: BIO 181, 182, 340; MIC 201, or 210; MIC 202; and 8 additional hours in courses listed under Biology, Botany, Microbiology, and Zoology, with the *exception* of the following: BIO 100, 218, 318; BOT 100; ZOL 110, 300. Supporting course: BIO 480 is required in addition to the 24 hours credit in biological sciences.

Departmental Graduate Program

The Department of Zoology offers programs leading to the degrees of Master of Science, Master of Natural Science, and Doctor of Philosophy. Consult the *Graduate College Catalog* for requirements.

BIOLOGY

BIO 100 The Living World. (4) F, S, SS
Principles of biology. Cannot be used for major credit in the biological sciences. Three hours lecture, 3 hours laboratory.

181, 182 Biological Principles and Processes. (4, 4) F, S, SS
Biological concepts emphasizing fundamental principles and the interplay of structure and function at the molecular, cellular, organismal, and population levels of organization. For majors in biological sciences and preprofessional students in health related sciences. Secondary school chemistry strongly recommended (BIO 181 is a prerequisite for BIO 182). Three hours lecture, 3 hours laboratory.

217 Introduction to Fisheries and Wildlife Management. (3) F
Management of fisheries and terrestrial wildlife, emphasizing management of ecosystems. Designed for prospective Wildlife biologists. Prerequisites: 8 hours of biology.

218 History of Medicine. (1) F
Development of medical concepts.

300 Natural History of Arizona. (3) F
Plant and animal communities of Arizona. Cannot be used for major credit in the biological sciences. Prerequisite: junior standing.

301 Field Natural History. (1) F, S
Organisms and their natural environment. Two weekend field trips and a field project. Prerequisite: BIO 300 or concurrent enrollment. Cannot be used for major credit in the biological sciences.

310 Special Problems and Techniques. (1-3) F, S
Qualified undergraduates may investigate a specific biological problem under the direction of a faculty member. Prerequisites: approval of the problem by the faculty member and departmental chair. May be repeated for a total of 6 credits.

320 Fundamentals of Ecology. (3) F, S
Organization, functioning and development of ecological systems, energy flow, biogeochemical cycling, environmental relations, population dynamics. Prerequisites: BIO 182 or approval of instructor.

330 Ecology and Conservation. (3) F
Ecological and biological concepts of conservation used to understand man-made ecological problems. Cannot be used for major credit in the biological sciences.

332 Cell Biology. (3) F
Survey of major topics in cell biology, including structural, biochemical, and molecular aspects of cell function. Prerequisite: BIO 182.

340 General Genetics. (4) F, S, SS
Science of heredity and variation. Prerequisite: BIO 182†. Three hours lecture, 1 hour recitation.

415 Biometry. (4) F
Statistical methods applied to biological problems, design of experiments, estimation, significance, analysis of variance, regression, correlation, chi square and bioassay; the use of computers. Does not satisfy laboratory requirements for the Liberal Arts General Studies program. Prerequisites: MAT 210† or equivalent. Three hours lecture, 3 hours laboratory.

424 Analysis of Ecosystems. (3) F '86
Ecosystems, emphasizing production, respiration, and decomposition. Prerequisite: BIO 320†.

426 Limnology. (4) S
Structure and function of aquatic ecosystems with emphasis on freshwater lakes and streams. Three lectures, 3 hours laboratory or field trip. Prerequisites: BIO 320† or approval of instructor.

428 Biogeography. (3) F
Environmental and historical processes determining distributional patterns of animals and plants, emphasizing terrestrial life. Prerequisites: BIO 182† or equivalent; junior standing.

429 Advanced Limnology. (3) S
Recent literature, developments, methods and limnological theory; field and laboratory application to some particular topic in limnology. Prerequisite: BIO 426†.

430 Advanced Developmental Biology. (3) S
Current concepts and experimental methods involving differentiation and biosynthetic activities of cells and organisms, with examples from micro-organisms, plants, and animals. Prerequisite: ZOL 330†.

432 Biochemical Cytology. (3) S
Cellular functions and chemistry based on the macromolecular organization of cellular components, emphasizing the use of analytical procedures such as cell fractionation, ultrastructural radioautography, and cytochemistry. Prerequisites: BOT 360† or ZOL 360† or equivalent; CHM 231† or 331† or equivalent.

441 Cytogenetics. (3) F
Chromosomal basis of inheritance. Prerequisite: BIO 340†.

442 Cytogenetics Laboratory. (2) F
Microscopic analysis of meiosis, mitosis and aberrant cell division. Prerequisite: BIO 441† or concurrent enrollment. Six hours laboratory.

443 Molecular Genetics. (3) F
Nature and function of the gene. Prerequisites: BIO 340† and a course in organic chemistry.

445 Organic Evolution. (3) F
Processes of adaptive change and speciation in sexual populations. Prerequisite: BIO 340† or ZOL 241.

464 Photobiology. (3) S
Principles underlying the effects of light on growth, development, and behavior of plants, animals, and micro-

organisms. Prerequisites: 12 hours of courses in life sciences; CHM 231† or 331†.

480 Methods of Teaching Biology. (3) S
Methods of instruction, experimentation, organization and presentation of appropriate content in biology. Prerequisites: either SED 311† or concurrent enrollment in SED 311† and 20 hours in the biological sciences. Two hours lecture, 3 hours laboratory.

512 Transmission Electron Microscopy. (4) F, S
Theory, use, and methods of preparing biological materials for transmission electron microscopy. Prerequisite: approval of instructor. Material fee. Two lectures, 6 hours laboratory.

515 Scanning Electron Microscopy. (2) N, SS
Theory and use of scanning electron microscope for biological materials. Intensive five-week mini course. Prerequisite: approval of instructor. Materials fee. Three hours lecture, 6 hours laboratory.

520 Biology of the Desert. (2) N
Factors affecting plant and animal life in the desert regions and adaptations of the organisms to these factors. Prerequisite: 10 hours of biological sciences or approval of instructor.

526 Quantitative Ecology. (3) N
Sampling strategies, spatial pattern analysis, species diversity, classification and applications of multivariate techniques to ecology. Prerequisites: one course in ecology; BIO 415† or equivalent. Two hours lecture, 3 hours laboratory.

Special Courses: BIO 394, 492, 493, 494, 497, 498, 499, 500, 590, 591, 592, 598, 599. (See pages 35-36.)

ZOOLOGY

ZOL 110 Contemporary Zoology. (4) F, S
Topics emphasizing socially relevant problems. Cannot be used for major credit in the biological sciences. Three hours lecture, 3 hours laboratory.

201 Human Anatomy-Physiology. (4) F, S, SS
Structure and dynamics of the human mechanism. Cannot be used for major credit in the Department of Zoology. Three hours lecture, 3 hours laboratory.

202 Human Anatomy-Physiology. (4) F, S, SS
Continuation of ZOL 201. Cannot be used for major credit in the Department of Zoology. Prerequisite: ZOL 201 or approval of instructor. Three hours lecture, 3 hours laboratory.

241 Human Genetics. (3) F, S, SS
Introduction to human heredity and variation. Cannot be used for major credit in the Department of Zoology. Prerequisite: a course in the life sciences.

270 Vertebrate Zoology. (4) F, S
Characteristics, classification, evolution and natural history of the major groups of vertebrate animals. Prerequisite: BIO 102†. Three hours lecture, 3 hours laboratory.

280 Introductory Animal Behavior. (3) F
Evolutionary, genetic, physiological and ecological bases of animal behavior. Prerequisite: Four hours of BIO, or ZOL, or approval of instructor.

300 Biogenetics of Man. (4) S
Concepts of ecology, heredity and evolution and their relation to human affairs. Cannot be used for major credit in life sciences.

311 Animal Microtechnique. (2) N
Zoological microtechnique, including the preparation for microscopic examination of animal structures, tissues, cells and whole mounts. Prerequisite: BIO 102†. Six hours laboratory.

330 Developmental Anatomy. (3) F
General developmental biology (embryology) and comparative structure of organ systems, illustrated mainly by vertebrate examples. Prerequisite: BIO 182†.

331 Laboratory in Vertebrate Developmental Anatomy. (2) F, S
Morphology of representative embryonic and adult vertebrates. Prerequisite: BIO 182†. ZOL 330 recommended. Two 3-hour laboratories.

350 Comparative Invertebrate Zoology. (4) F
Characteristics, life cycles, adaptational biology, and evolution of invertebrate animals. Prerequisites: BIO 102† or approval of intructor. Three hours lecture, 3 hours laboratory.

354 General Entomology. (4) F, S
Form, activities and classification of insects. Prerequisites: BIO 182†. Three hours lecture, 3 hours laboratory. (formerly ENT 300).

360 Basic Physiology. (4) F, S
Physiological mechanisms of the higher vertebrates. Prerequisites: BIO 102†, CHM 115†, MAT 115. Three hours lecture, 3 hours laboratory.

380 Sociobiology. (3) S
Survey of animal and human social behavior examined from an evolutionary perspective. Suitable for nonmajors. Prerequisite: ZOL 280† is recommended.

394 Special Topics (Non-majors). (2-3) N
Topics of current or special interest in one or more aspects of animal biology. Topics vary. Prerequisite: Junior standing. Cannot be used for major credit in life sciences.

411, 412 Wildlife Management I, II. (4, 4) F, S
Principles, practices and techniques of wildlife management. Prerequisites for ZOL 411: BIO 217†, 320†, ZOL 471†, 472†; or approval of instructor. Prerequisite for ZOL 412: ZOL 411†. Three hours lecture, 3 hours laboratory or field trips, weekend field trips.

413 Fisheries Management I. (4) F
Principles and theory of fisheries management. Prerequisite: 10 hours of biology. Three hours lecture, 3 hours laboratory or field trips, weekend field trips.

420 Field Zoology. (3) N
Experience in zoological field techniques. Requires weekend or longer field trips. Prerequisite: approval of instructor.

423 Population and Community Ecology. (3) F '85
Organization and dynamics of population and communities, emphasizing animals. Theoretical and empirical approaches. Prerequisite: BIO 320† or approval of instructor.

424 Parasitology. (4) N
Morphology, physiology and life histories of animal parasites, therapeutics, control and host-parasite relationships. Prerequisite: BIO 182†. Three hours lecture, 3 hours laboratory.

425 Animal Ecology. (3) F '85
Physiological and behavioral adaptations of individual animals to both abiotic and biotic environment. Prerequisite: BIO 320†.

433 Animal Histology. (4) N
Microscopic study of animal tissues. Prerequisites: BIO 182† or approval of instructor. Three hours lecture, 3 hours laboratory.

440 The Nucleus. (3) S '86
Experimental studies in chromatin and chromosome structure. Molecular mechanisms of chromosome movement and mechanics, cell population kinetics, the nucleolus and the nuclear envelope. Prerequisites: CHM 261† or 335†, and BIO 340†.

441 Principles of Human Genetics. (3) F
Genetics in human populations, including medical aspects. Prerequisite: BIO 340.

453 Protozoology. (3) N
Systematics and biology of protozoa. Prerequisite: BIO 102†. Two hours lecture, 3 hours laboratory.

454 Aquatic Insects. (3) F
Systematics and ecology of aquatic insects. Prerequisite: ZOL 354† (formerly ENT 400).

460 Comparative Physiology. (4) F, '85
The analysis of function in invertebrates and vertebrates, emphasizing evolutionary trends in physiological systems. Prerequisite: ZOL 360† or equivalent. Three hours lecture, 3 hours laboratory.

465 Neurophysiology. (3) S '86
Detailed treatment of cellular and organismal neurophysiology and nervous system function. Prerequisite: ZOL 360†.

466 Neurophysiology Laboratory. (2) S '86
Intracellular and extracellular electrophysiological recording techniques, histological preparations, and dye-filling techniques. Prerequisite or Corequisite: ZOL 465†. Six hours Laboratory.

468 Mammalian Physiology. (4) S '87
Detailed treatment of mammalian organ system functions emphasizing integrative mechanisms. Prerequisite: ZOL 360† or equivalent. Three hours lecture, 3 hours laboratory.

469 Cellular Physiology. (4) F '86
Emphasizing the molecular basis for cell structure and function. Prerequisites: ZOL 360†, organic chemistry. Three hours lecture, 3 hours laboratory.

470 Systematic Zoology. (3) S '87
Philosophy, theory, and practice in interpreting patterns of animal diversity, including species concepts and speciation, nomenclature and taxonomy, evolutionary and phylogenetic classification. Prerequisite: Junior standing; 18 hours in life science.

471 Ornithology. (3) S
Natural history and field study of birds, emphasizing Arizona species. Prerequisite: ZOL 270† or approval of instructor. Two hours lecture, 3 hours laboratory. Weekend field trips.

472 Mammalogy. (4) F
Classification, structure, habits, ecology and distribution of mammals, emphasizing North American forms. Prerequisite: ZOL 270† or approval of instructor. Three hours lecture, 3 hours laboratory or field trip. Weekend field trips.

473 Ichthyology. (3) S '87
Systematics and biology of recent and extinct fishes. Prerequisites: ZOL 270†, 425† or approval of instructor. Two hours lecture, 3 hours laboratory or field trip. Weekend field trips required.

474 Herpetology. (3) S '86
Systematics and biology of recent and extinct reptiles and amphibians. Prerequisite: ZOL 270†. Two hours lecture, 3 hours laboratory or field trip.

481 Laboratory in Animal Behavior. (3) S
Experimental and field studies of animal behavior; description and quantification of animal behavior, interpretation of behavior within an evolutionary framework. Prerequisite: ZOL 280. One hour lecture, 6 hours laboratory.

515 Populations: Evolutionary Genetics. (3) F
Mathematical models in the description and analysis of the genetics of populations. Prerequisites: BIO 320†, 415†, and 445†, or approval of instructor.

516 Populations: Evolutionary Ecology. (3) S
Principles of population biology and community ecology within an evolutionary framework. Prerequisites: MAT 210† or BIO 415†, 320†, ZOL 515†. Two hours lecture, 2 hours recitation.

532 Developmental Genetics. (3) S '86
Genetic approaches to the analysis of development during the life cycle of eukaryotic organisms; role of genes in the unfolding of the differentiated phenotype. Prerequisite: BIO 443†.

565 Advanced Parasitology. (3) N
Historical and analytical approach to the treatment of selected areas in the body of knowledge relating to parasites and parasitism. Prerequisite: ZOL 424†.

566 Environmental Physiology. (3) S '86
Physiological responses and adaptations of animals to various aspects of the physical environment. Prerequisites: ZOL 360†; BIO 320†.

591 Seminar. (1-3) F, S, SS
Topics such as the following will be offered: a) Behavior, b) Development, c) Ecology, d) Genetics, e) Physiology, f) Evolution, g) Adaptations, h) Genetic Engineering. May be repeated for credit.

Special Courses: ZOL 294, 394, 484, 492, 493, 494, 497, 498, 499, 590, 592, 594, 598, 599, 790, 791, 792, 799. (See pages 35-36.)

College of Architecture and Environmental Design

Gerald R. McSheffrey, Dip. C.D.
Dean

Purpose

The three major functions of the College of Architecture and Environmental Design are:

1. Educate and prepare students for specific professional careers in architecture, urban planning, industrial design, interior architecture, and other problem-solving, decision-making fields related to the designed and built environment.
2. Provide students opportunities at the graduate level to participate with faculty in research and to expand their professional potential for a diversity of roles related to the environmental design professions.
3. Further develop faculty research relevant to community, professional, and regional needs and provide opportunities for continuing education and post-professional development.

Organization

The College is composed of three academic units: the Department of Architecture, the Department of Design Sciences, and the Department of Planning. A fourth unit, the Professional Development Office, provides special programs for the public and offers advanced professional education courses. The general administration of the College is the responsibility of the Dean, who in turn is responsible to the President through the Vice President for Academic Affairs.

College Facilities

The College of Architecture and Environmental Design building, opened in 1979, provides space for the College's activities. Facilities include design studios, lecture and seminar rooms, technology laboratories, as well as offices for faculty, administration and student organizations, the Howe Architecture Library, the Gallery of Design, Media Center, and the Slide Collection, and computer laboratories.

Howe Architecture Library. As a branch of the University library, the Howe Library is located in the main building and provides easy access to books, periodicals, and reference materials for students and faculty. The collection includes over 18,000 volumes as well as special research collections on the work of Paolo Soleri and Frank Lloyd Wright.

Gallery of Design. The Gallery of Design is one of eight University galleries and museums. It provides premium space for traveling exhibitions and exhibitions of student and faculty work.

Special Facilities. College programs are supported by several kinds of special laboratories. Computer facilities in the College provide a teaching and research laboratory for students and faculty. The computer laboratory is operated by University Computing Services with an adjacent research laboratory for computer-aided design and graphics operated by the College. The College's photographic laboratory and darkroom provides high-quality equipment and space for student and research projects. A shop, equipped to handle wood, plastic, and metal, supplements studio space. The College's Media Center includes traditional audio-visual equipment as well as graphics and portable video equipment. The Slide Collection, with over 10,000 slides, is available for instructional use. The College maintains an outdoor laboratory adjacent to

the main building as a solar workshop and materials testing laboratory. The Research and Service Foundation of the College is a non-profit organization contributing faculty and student time to research, community service, and professional development.

Degrees

Undergraduate. The college offers programs leading to a four-year undergraduate degree: Bachelor of Science in Design. Students select one of the following majors within the respective departments:

Department of Architecture
B.S. Design, major in Architectural Studies

Department of Design Sciences
B.S. Design, major in Design Science
B.S. Design, major in Industrial Design
B.S. Design, major in Interior Architecture

Department of Planning
B.S. Design, major in Urban Planning
B.S. Design, major in Housing and Urban Development

Each undergraduate program is divided into a lower division and an upper division program.

Graduate. The Graduate College awards the master's degree to candidates who have successfully completed graduate programs offered in this College. Two degrees are offered: the professional degree, Master of Architecture (M. Arch.), and the multidisciplinary degree, Master of Environmental Planning (M.E.P.) with a major in Environmental Planning. For more information consult the *Graduate College Catalog.*

Curriculum

Students seeking the Bachelor of Science in Design degree must satisfactorily complete a curriculum of a minimum of 134 hours. Requirements include 6 hours of English Proficiency and 36 credits of General Studies requirements.

	Semester Hours
Major Field of Study & Approved Electives	92
English Proficiency	6
General Studies	36
Humanities and Fine Arts	(6)
Behavioral and Social Sciences	(6)
Science and Mathematics	(11)
General Studies electives	(13)
Minimum Total	134

Admission

Lower Division Programs. New and transfer students who have been admitted to the University and select a College major are admitted to the lower division programs. A separate application admission procedure is required for entry to the upper division programs and graduate programs. Acceptance into lower division programs does not guarantee acceptance to upper division programs.

Transfer Credits. While the University accepts credits transferred from other accredited institutions, transfer credits are not applied to specific degree programs until reviewed and accepted by the College and its departments. Transfer course work must be equivalent in both content and level of offering. In addition, a portfolio review is usually required for studio work.

Upper Division Programs. Admission to upper division programs is competitive. Consult department requirements for details. Students applying to more than one department must make separate applications to each department and must submit separate portfolios. Students not currently enrolled at ASU must also make a separate application to the University. Transfer applications into upper division programs are considered only if vacancies occur. Admission is limited to students with equivalent course work who are competitive with continuing students.

Graduate Programs. For admission to the graduate programs in the College of Architecture and Environmental Design, see requirements and procedures under the respective departments and the *Graduate College Catalog.* Students must make separate applications and be admissible first to the Graduate College and also to the department administering the degree program selected.

Academic Requirements

Incompletes. It is the student's responsibility to contact the instructor regarding the process of requesting and fulfilling an incomplete. Tardiness in contacting the instructor may result in a failing grade. Generally, the student submits a written request for an incomplete to the instructor. The request must include a justification, a listing of requirements that have not been fulfilled, and a proposed schedule of completion. The instructor reviews the request, proposes

modifications if necessary, and submits a copy of the request to the department chair for approval. An incomplete in a course in an upper division program that is prerequisite for sequential courses automatically places the student on probation and denies enrollment in subsequent courses. Failure to satisfactorily remove an incomplete before the prescribed deadline results in failure of the course. Also see University requirements on incompletes, page 36.

Withdrawals. University withdrawal regulations apply to lower division courses. Because the College's upper division programs are modular and sequential and space in the programs is limited, students are expected to progress through the curriculum with their class. Withdrawal from a required course automatically places a student on probation. Withdrawal from a required course in a required sequence automatically removes the student from the program beginning the subsequent semester. Also see University requirements on withdrawals, page 37.

Retention Standards

Lower Division Program Retention Standards. Students in the College's lower division programs are placed on probation when they fail to maintain a cumulative grade point average (GPA) of 2.0. Students on probation must observe rules or limitations the College Standards and Appeals Committee imposes on their probation as a condition of retention. If after one semester on probation the overall G.P.A. is not at least a 2.0 and/or the conditions of probation have not been met, the student will be disqualified. Appeals may be made to the College Standards and Appeals Committee before the beginning of the following semester. Also see University retention standards, page 38.

***Upper Division Programs* Retention Standards.** Students in upper division programs are placed on probation when they fail to meet *any* of the following requirements:

a. failure, incompete, or withdrawal from any required course.
b. a semester GPA below 2.0.
c. a grade of D or E in a design studio or design laboratory.
d. violation of the College code of student responsibility, admission agreement.

Students on probation must observe rules or limitations their respective departmental Standards and Appeals Committees place on their probation as a condition of continuation. Students will be removed from departmental programs if:

a. after one semester on probation the requirements imposed are not met and/or the overall GPA is not above 2.0.
b. failures or withdrawals in required courses are not resolved at the next offering of the course.
c. failures or withdrawals from required sequential courses are not resolved.
d. incompletes in required sequential courses are not completed before the first day of class of the next semester.

If space is not available, students removed from departmental programs are not guaranteed reinstatement in the program even if probation requirements or requirements placed on readmission after removal from a program are fulfilled. Appeals may be made to departmental Standards and Appeals committees. Also see University retention standards, page 38.

Special Honors at Graduation. At the time of graduation students with academic distinction in the professional programs of the College are awarded the respective designation *cum laude, magna cum laude,* or *summa cum laude.* Also see University requirements for graduation with academic distinction, page 44.

Student Responsibilities

Code of Student Responsibility. The purpose of this code is to promulgate standards of conduct for students of the College of Architecture and Environmental Design and to establish procedures for reviewing violations. Students are expected to support and maintain the highest professional standards with regard to their individual conduct and their personal and common environments in the College of Architecture and Environmental Design during their tenure at this institution. Copies of the Code are available from the Office of the Dean.

Attendance. Attendance is expected at all classes, laboratories, and seminars and is a criteria for evaluating performance. Unexcused absences may result in failure of a course or academic probation. A student may not be excused from submitting work or from class except for medical reasons or

other serious personal conditions beyond the control of the student. Any request for an excused absence or for late submission of work must be submitted in writing to the instructor. If accepted, a student may be allowed to take a late or special examination or submit missing work. Tardiness in contacting the instructor is cause for denying acceptance. Also see University policy regarding religious holidays.

Advising. While the College and the departments provide academic advising, it is ultimately the responsibility of each student to fulfill academic and program requirements. Advising and record keeping for lower division program students are the responsibility of the College Academic Advisor. Records for upper division program students are kept in the applicable departments. Faculty who serve as upper division academic advisors are assigned by department chairs. General career advising is available from all faculty members. Administration of departmental program requirements is the responsibility of the appropriate department chair. Administration of department and College requirements is the responsibility of the appropriate department chair and the Dean. Appeals and requests for variances are typically made to the student's advisor, the department chair, the College Standards and Appeals Committee and the Dean.

Employment. It is difficult for students in professional programs to carry part-time employment while in school. Acceptance to any of the College's programs presumes a commitment of a minimum of eight hours a day for professional studies. Prior work experience is not a requirement for admission to upper division programs.

Projects. The College reserves the right to retain any or all projects submitted to meet course requirements for the College's future instructional, publication, and exhibition use.

Department Leave of Absence. Upper division students who withdraw from classes or do not continue sequentially in enrollment must request leave of absence in writing from the appropriate department chair. Leaves of absence are for one year increments and may be approved for personal reasons, travel, work, or additional study in other disciplines. Students on leave must make written request to the appropriate department chair for readmission prior to May 1 for the fall semester of the year of return to the program, or November 1 for the spring semester, in order that a space may be reserved. Failure to request a leave of absence may result in removal from the program.

General Information

Accreditation. The professional degree, Master of Architecture, is accredited by the National Architectural Accrediting Board and recognized by the Arizona State Board of Technical Registration and the National Council of Architectural Registration Board.

Affiliations. The College of Architecture and Environmental Design maintains active affiliations with the Arizona Society of Architects, the Central Arizona and the Rio Salado Chapters of the American Institute of Architects, the Association of Collegiate Schools of Architecture, the American Planning Association, the Association of Collegiate Schools of Planning, the American Society of Landscape Architects, the American Society of Interior Designers, the Industrial Designers Society of America, the Institute of Business Designers, the Interior Design Educators Council, and the National Student Council of the American Society of Interior Designers.

Foreign Study. The College of Architecture and Environmental Design maintains active communications with several foreign institutions offering professional course work similar to programs of the College. This opportunity is available for students who wish to pursue professional studies at a foreign institution in lieu of resident course work for up to a maximum of one academic year. Interested students are encouraged to inform their department chair at the earliest possible date of any intentions for foreign study.

Current exchange programs exist with the Universitat Stuttgart, West Germany, and the Universidad Autonoma de Guadalajara, Guadalajara, Mexico. A foreign study program in London is offered by the Department of Architecture. Students should consult their respective department chair regarding new affiliations or other foreign study opportunities.

Students are also encouraged to consider foreign travel for either a semester or an entire academic year. A departmental leave of absence must be requested for foreign study and foreign travel. Departments reserve the right to evaluate the content and the stu-

dent's competency in each of the courses completed at foreign institutions.

Internships. Upper division students in the Departments of Architecture and Design Sciences are required to complete an internship program during the summer between the third and fourth year.

College of Architecture and Environmental Design Alumni Association. The College Alumni Association encourages graduates to contribute to the College by acting as liaisons with the College community, students, and the practicing professions. The College also can call on the members of the Architecture Guild of Arizona State and the College Board of Overseers for advice and to promote the goals of the College and departments.

Student Professional Associations. The purpose of the student associations is to assist students with the transition into professional life and to acquaint them with the profession relating to their program of study. These include:

Student Chapter/American Institute of Architects
Student Chapter/American Planning Associations
Student Chapter/American Society of Landscape Architects
Student Chapter/American Society of Interior Designers
Student Chapter/Industrial Designers Society of America

Department of Architecture

General Information

The faculty of the Department of Architecture offer three degree programs: The Bachelor of Science in Design with a major in Architectural Studies, the Master of Architecture, and the Master of Environmental Planning with a concentration in Building Design.

The professional program in architecture culminates in the Master of Architecture degree. Accredited by the National Architectural Accrediting Board, this degree program consists of three continuous two year segments:

(A) Pre-Professional; B.S. in Design (minimum 63 credit hours),
(B) Professional Level (Upper Division); B.S. in Design (minimum 71 credit hours),
(C) Professional Level Graduate Studies; M. Architecture (minimum 56 credit hours).

Admission to the professional level is possible either (a) after the completion of two years of a required pre-professional studies (minimum of 63 credit hours) at the undergraduate level or, (b) after receipt of a four-year degree, Bachelor of Science in Design (with a major in Architectural Studies), or equivalent degree from another school which offers an accredited professional degree in architecture. Transfer or entry into the architecture program cannot be accommodated at other times.

The architecture program at ASU offers an exceedingly high quality and integrated curriculum of professional studies focused on the design laboratory. In addition, it is the presumption of the faculty that future leaders in the architecture profession will successfully combine specialized skills with a broad scope of related studies, including course work in the humanities and social sciences.

Upper division students are expected to develop a particular specialization or emphasis in one or more areas including solar and energy conscious design, computer-aided architecture, administration, urban design, and building technology.

The professional program reflects an awareness of the diverse, complex factors affecting the built environment. It attempts to foster the understanding, knowledge, and problem-solving skills necessary to meet this complexity through a systematic as well as scholarly approach to understanding technical limitations and state-of-the-art developments.

The Master of Environmental Planning degree is intended to provide opportunities for advanced specialized studies and research in building design and methods. Areas of emphasis include computer-aided design, passive solar design and energy technology/analysis, and advanced architectural administration. Students entering this degree program typically have the professional Bachelor of Architecture or Master of Architecture degree, or undergraduate degrees in such areas as physics, engineering, or design. For particulars, consult the *Graduate College Catalog.*

Degree Requirements. The degree, Bachelor of Science in Design with a major in Architectural Studies, requires a minimum of 134 hours of required and approved course work. Most students will pursue Option A; however, those who intend to eventually seek an advanced degree in either Engineering or Building Technology are encouraged to fulfill the requirements outlined in Option B. Entering students who have deficiencies in secondary school units (usually in the areas of math and science) shall be required to complete additional university credit course work which will not be applied to the Bachelor of Science in Design degree.

The professional degree, Master of Architecture, requires an additional 56 hours of approved graduate level course work. For detailed information consult the *Graduate College Catalog*.

The listed Option A or Option B pre-architecture requirements are normally completed in the first two years of university study. Formal application and acceptance is necessary before admission to the professional level, normally commencing at the third year. See application procedures for specific information. Completion of pre-architecture studies does not ensure acceptance at the professional level, at which point admission is competitive and limited to the space available.

Pre-Architecture and Core Requirements
Department of Architecture
(Option A)

			Semester Hours
		English	
ENG	101	and 102 Freshman Composition	
		OR	
ENG	105	Advanced Freshman Composition AND approved Humanities and Fine Arts elective	6
		Humanities and Fine Arts	
APH	100	Intro. to Environmental Design I	2
APH	101	Intro. to Environmental Design II	2
		Electives: Art History, Foreign Languages, Dance History, English, Humanities, Music History, Philosophy, Religious Studies	6
		History/Theory of Architecture, Design, or Planning	3
		Social and Behavioral Sciences	
COM	311	Public Speaking OR other approved communication elective	3
ECN	111	Macroeconomic Principles or 112 Microeconomic Principles OR approved business course	3
		Electives: History, Anthropology (ASB), Cultural Geography, Journalism, Economics, Political Science, Business, Psychology (PGS), Public Affairs, Justice Studies, Sociology	6
		Science and Mathematics	
MAT	260	Technical Calculus I*	3
MAT	261	Technical Calculus II OR approved math or statistics elective	3
PHY	111	& 113 General Physics I (Recitation and Lab)	4
PHY	112	& 114 General Physics II (Recitation and Lab)	4
CSC	183	Programming in FORTRAN (or other approved programming language)	3
		Electives: Anthropology (ASM), Botany, Chemistry, Computer Science, Engineering, Geology, Mathematics, Physical Geography, Physics, Psychology (PSY), Statistics	3
		Core	
AVC	141	Design Graphics	2
AVC	160	Freehand Perspective Drawing I	2
AVC	161	Freehand Perspective Drawing II	2
ADE	221	Design Fundamentals I	3
ADE	222	Design Fundamentals II	3
			63

*Requires MAT 115 or equivalent as prerequisite.

Pre-Architecture and Core Requirements
Department of Architecture
(Option B)

			Semester Hours
		English	
ENG	101	and 102 Freshman Composition	
		OR	
ENG	105	Advanced Freshman Composition AND approved Humanities and Fine Arts elective	6
		Humanities and Fine Arts	
APH	100	Environmental Design I	2
APH	101	Environmental Design II	2

Electives: Art History, Foreign Languages, Dance History, English, Humanities, Music History, Philosophy, Religious Studies			6
History/Theory of Architecture, Design, or Planning			3

Social and Behavioral Sciences

COM	311	Public Speaking OR other approved communication elective	3
ECN	111	Macroeconomic Principles or 112 Microeconomic Principles OR approved business course	3

Science and Mathematics

MAT	290	Calculus I	5
MAT	291	Calculus II	5
MAT	274	Differential Equations	3
ECE	383	Probability and Statistics*	(2)
ECE	102	Introduction to Engineering	2
PHY	115	University Physics	4
PHY	117	University Physics Lab	1
PHY	116	University Physics	4
PHY	118	University Physics Lab	1
ECE	210	Engineering Mechanics I/ Statics	3
ECE	312	Engineering Mechanics II/ Dynamics*	(3)
ECE	313	Introduction to Deformable Solids*	(3)
CSC	183	Programming in FORTRAN	3

Core

AVC	141	Design Graphics	2
AVC	160	Freehand Perspective Drawing I	2
AVC	161	Freehand Perspective Drawing II	2
AVC	221	Design Fundamentals I	3
AVC	222	Design Fundamentals II	3
			68

*These courses may be taken at the professional level as professional electives; and are not required for application to the Professional Program.

[1]Upper division courses with department approval.

[2]Approved substitute courses are accepted from the College of Engineering and Applied Sciences for Option "B" students.

[3]These courses may be completed prior to admission to the professional program.

Undergraduate Architectural Studies/ Professional Program

(Pre-Architecture Requirements—a minimum of 63 selected credit hours—must be fulfilled prior to admission of the professional level.)

Semester Hours

Third Year

Fall

ADE	321	Architectural Design/Process Determinants	3
ATE	361	Building Structures I[2]	3
APH	313	History of Western Arch. I[3]	3
ATE	353	Architectural Construction I	3
ANP	331	Environmental Analysis and Programming	3
AVC	301	Architectural Communication I	2
			17

Spring

ADE	322	Architectural Design/ Environ. Determinants	5
ANP	431	Facility Programming and Methods	3
APH	314	History of Western Arch. II[3]	3
ATE	351	Environmental Control Systems	3
ATE	362	Building Structures II	3
			17

Summer

ARP	484	Internship	3

Fourth Year

Fall

ADE	421	Architectural Design/Human & Behavioral Determinants	5
ATE	461	Building Structures III[2]	3
APH	446	20th Century Architecture I	3
ATE	452	Environ. Control Systems II	3
		Approved Elective	3
			17

Spring

ADE	422	Architectural Design/Social Determinants	5
ATE	462	Building Structures IV[2]	3
APH	447	20th Century Architecture II	3
ATE	451	Architectural Construction II	3
		Approved Elective[1]	3
			17
		Subtotal Professional Program	71
		Subtotal Pre-architecture (minimum)	63
Bachelor of Science in Design Major in Architectural Studies *(Total Minimum)*			134

Admission to the Professional Program: To be eligible for consideration for admission to the professional program at the undergraduate level, the following is required:

1. Completion of all specified pre-architecture studies requirements (a minimum of 63 hours) or equivalents approved by the academic advisor or department faculty.
2. A certificate of admission to Arizona State University. (Note: application to the professional program is separate from and in addition to the required admission to Arizona State University.)
3. A minimum University cumulative grade index (GPA) of 3.0, as well as a 3.0 index based only on the required pre-architecture courses.

In an unusual circumstance, when the admission standard deficiency is slight, written evidence of extenuating circumstances is convincing, and promise for success is evidenced, a student may be granted admission on a provisional basis.

The limited number of spaces available each year will be awarded to applicants evidencing the highest promise for professional success, including evidence of ability and prospect for significant public service.

Application Procedures. Students should write to the Academic Advisor for the application form well in advance of the application deadline.

Deadlines:

Application deadline: 4:00 p.m. April 15. (All material in the application format described below).
Spring semester transcripts: June 15.
Notification: July 1.
Return of Letter of Acceptance: A signed receipt of acceptance of admission must be received by the department by the date indicated on the notice of acceptance. Alternates will be accepted at a later date as space becomes available.
Portfolios available for return: July 16.
Matriculation: Accepted students are expected to begin their upper division programs at the beginning of the immediate fall term. There is no spring admission to the upper division.

Application Format. Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves (8 1/2" x 11" format only.) Items must appear in the following order:

Page 1 - Department application form completely filled out with page 1 visible.
Page 2 - Department application forms with page 2 visible.
Page 3 - High school transcripts from all schools attended.
Page 4 - Certificate of ACT, SAT, GRE, or TOEFL test scores, as applicable.
Page 5 - College transcripts from all schools attended showing completion of lower division program requirements. Note: Transcripts should be complete except for the current Spring semester. Spring semester transcripts must be received by the Department before June 15.
Page 6 - Copy of Arizona State University Certificate of Admission.
Pages following - Examples of the applicant's graphic skill and creative ability:

A. Include as a minimum 2-3 examples from each of the lower division studio courses (141, 160, 161, 221, 222) or work from similar courses taken elsewhere. Include a concise statement that briefly explains each project being illustrated, the educational goal, the length of time allotted for each project, and other pertinent information as applicable, names of other team members.
B. You are encouraged to include additional materials, written or pictorial, that you feel provide additional evidence of your skills and abilities, as well as aptitude and commitment to your field of professional study.

When any work is submitted not completely original, the source *must* be given. When work is of a team nature, the applicant's role in the project should be clearly indicated. Original examples or slides *must not* be submitted. All examples must be photographs or other reproduction graphic media.

Return of Application Materials. The Department Application Form remains the property of the department, however the remainder of the submitted materials will be returned after July 15 if the applicant encloses a self-addressed return mailer with sufficient prepaid postage. The applicant may also receive it in person at the department office. If the applicant provides signed authorization, another party may receive it for him/her. After one year the unclaimed materials are discarded. The college and the departments assume no liability for lost, damaged or unclaimed materials.

Organization and Instruction

The Department of Architecture's professional level program is organized by the faculty under the direction and administration of the chair. Subject matter within the department is categorized in the following instructional areas:

Architectural Administration and Management (AAD) develops the organization and managerial aspects of architectural practice. These studies examine the overall processes relative to management coordination, administraiton procedures, ethics, legal constraints, and the economics of architectural practice.

Architectural Design and Technology Laboratories (ADE) encourage synthesis of the knowledge and understanding the student has gained from previous and parallel course work and from other sources toward the comprehensive design development of architectural projects. The laboratories integrate the needs, limitations and determinants of design problems; applying analytical methods and technical skills in seeking and comparing alternative solutions for assigned problems.

Architectural Philosophy and History (APH) develops an understanding of architecture as both a determinant and a consequence of man's culture, technology, needs and behavior in the past and present. These studies are concerned with the rationale for the methods and results of design and construction.

Architectural Technology (ATE) develops knowledge of the technical determinants, resources and processes of architecture. These studies are concerned primarily with the science and technology of design and construction, including materials, building systems, acoustics, lighting, structural systems, environmental control systems, and both passive and active solar systems.

Environmental Analysis and Programming (ANP) develops capabilities to analyze and program environmental and human factors as preconditions for architectural design. These studies are concerned with the existing and emerging evaluation and analytical methods used by the profession.

Architectural Communications (AVC) provides the student with an opportunity to develop and reinforce visual communication methods in special areas, such as graphics, communications and design.

Energy Design (EDE) develops advanced problem-solving capabilities with projects relating to building or component design that synthesizes solar or bioclimatic opportunities and/or energy conserving applications.

Energy Technology (ETE) provides specialized instruction in the technical aspects of energy and solar applications to problems and processes that are typically measurable and quantifiable.

Architecture Professional Studies (ARP) provides students with residency and off-campus opportunities and educational experience in group and individual studies relative to specific student interest and faculty expertise.

A summer internship in an architect's office under the direction of an approved preceptor and licensed practitioner is required and provides a distinct educational experience. A special honors internship with nationally and internationally distinguished firms is also available for professional emphasis credit. This requires a separate application to and selection by the Department.

The Department also provides various required and optional field trips. (Supplemental fees are assessed for these offerings.) In addition, several foreign study opportunities are available for honor students.

Professional Emphasis Elective Course Work

Each student must complete the required professional elective course work from the following or approved emphasis areas:

Architectural Office Management
(Also courses in the College of Business.)

Construction Technology and Administration
(Also courses in the Division of Construction.)

Landscape Architecture
(Also courses in the Departments of Planning, Botany/Microbiology and Division of Agriculture.)

Structural Systems Design
(Also courses in the College of Engineering and Applied Sciences.)

Architectural History, Theory, and Preservation
(Also courses in art history, College of Fine Arts, and philosophy, College of Liberal Arts.)

Environmental Research, Analysis and Programming
(Also courses in the Departments of Sociology and Psychology.)
Solar Design and Technology
(Also courses in the College of Engineering and Applied Sciences.)
Energy Conservation/Adaptive Reuse
(Also courses in the Department of Planning.)
Housing and Urban Development
(Also courses in the Department of Planning.)
Urban and Regional Planning
Environmental Psychology and Sociology
Interior Architecture
(Also courses in the Department of Design Sciences.)
Computer Aided Design
(Also courses in the Department of Computer Sciences.)
Architectural History and Theory
Advanced Architectural Communications

Architecture

PROFESSIONAL PROGRAM

PROFESSORS:
SCHLUNTZ (ARCH 140), COOK, HERSHBERGER, OLIVER, PETERSON, RAPP

ASSOCIATE PROFESSORS:
JAKOB, McGINTY, SCALISE, SCHEATZLE, SHEYDAYI

ASSISTANT PROFESSORS:
BERTELSEN, CHRISTENSEN, FELLOWS, FIFIELD, FINDLEY, McINTOSH, PERRELL, VAN WYK, WU, ZYGAS

LECTURER:
IKEGAMI

VISITING PROFESSOR:
ROGERS

VISITING ASSISTANT PROFESSORS:
BROWN, DOWNING, MAUDLIN, PREDOCK

PROFESSORS EMERITUS:
ELLNER, STRAUB, WHIFFEN, YELLOTT

ARCHITECTURAL ADMINISTRATION AND MANAGEMENT

AAD 551 Architectural Management I. (3) F
Organizational, legal, economic and market aspects of architecture. Problem-solving approaches to market planning, human resources and organizational dynamics, and project management. Prerequisite: AAD 560, approval of instructor.

552 Architectural Management II. (3) S
Negotiation, risk management, project and firmwide financial issues and management in architecture. Modelling and simulation management planning and design strategy. Prerequisite: AAD 551 or approval of instructor.

553 Construction Contract Administration I. (3) F
Construction contract administration including budget control, scheduling, cash flow, changes and claims and monitoring systems for traditional, fast-track, and design-build methods. Two hours lecture/three hours lab including field trips. Prerequisite: AAD 560.

554 Construction Contract Administration II. (3) S
Advanced topics and problems in construction contract administration. Prerequisite: AAD 553 or approval of instructor.

555 Architect as Developer. (3) F, S
Development building, real estate, construction funding, land acquisition and the sources for capital. Prerequisite: approval of instructor.

560 Professional Practice I. (3) F
Professional practice issues including legal requirements, ethics, financial and marketing mechanisms, management, client relationships and new developments in practice. Prerequisite: admission to M. Arch program or approval of instructor.

562 Professional Practice II. (3) S
Aspects of practice including the economic structure of the industry, risk analysis, cost/performance analysis, value, and life cycle costing. Prerequisite: AAD 560 or approval of instructor.

ARCHITECTURAL DESIGN AND TECHNOLOGY LABORATORIES

ADE 221 Design Fundamentals I. (3) F
Exercises in basic visual organization: includes design vocabulary, principles of 2D and 3D composition, color, and aesthetic reactions to design. One hour lecture, six hours studio. Prerequisite: Major in college. Cross listed with DSC 221, PUP 221.

222 Design Fundamentals II. (3) S
Application of design fundamentals to environmental design problems. Introduces human scale, performance criteria, functional and aesthetic spatial organization and movement. One hour lecture, six hours studio. Prerequisite: Major in college, AVC 141, AVC 160, ADE 221. Cross listed with DSC 222, PUP 222.

321 Architectural Design/Process Determinants. (3) F
Fundamentals of architectural design, problem-solving techniques and the design process. Investigation, analysis, synthesis and development of design projects. Lecture, lab, and field trips. Prerequisite: approval of instructor.

322 Architectural Design/Environmental Determinants. (5) S
Application of comprehensive environmental determinants toward resolving human habitation needs. Emphasis on site, climate and other external factors. Lecture, lab and field trips. Prerequisite: ADE 321.

421 Architectural Design/Human and Behavioral Determinants. (5) F
Emphasis on the design of community facilities, user needs and activities. Man and his behavior as a primary architectural determinant. Lecture, lab and field trips. Prerequisites: ADE 322, ARP 484.

422 Architectural Design/Social Determinants. (5) S
Programmatic and comprehensive development of multi-building complexes relating to community, cultural and urban services. Emphasis on societal needs and expectations. Lecture, lab and field trips. Prerequisite: ADE 421.

521 Architectural Design/Urban and Spatial Determinants. (5) F
Comprehensive design with emphasis on medium-rise structures in the urban context. Form as a design determinant. Lecture, lab and field trips. Prerequisite: ADE 422.

522 Architectural Design/Building Systems. (5) S
Comprehensive design of multi-story structures. Analysis of building systems as form determinants. Economic feasibility studies of commercial buildings. Lecture, lab and field trips. Prerequisite: ADE 521.

621 Architectural Design: Advanced Specialization I. (3) F
Selected design options offered by each section of this course to include comprehensive architectural design and technology of various complex building types. Prerequisite: approval of instructor and chair.

622 Architectural Design: Advanced Specialization II. (3) S
Comprehensive design program options in various course sections emphasizing areas of specialization; integrating major architectural design determinants. Laboratory/lecture. Prerequisite: ADE 621.

ENVIRONMENTAL ANALYSIS AND PROGRAMMING

ANP 331 Environmental Analysis and Programming. (3) F
Analysis of the natural and human environmental determinants as the basis of the programming and design of the built environment. Emphasis on site and climate analysis and landscape/space theory. Prerequisite: professional level standing.

431 Facility Programming and Methods. (3) S
Programming and design methodologies, including problem seeking, goal identification, code search, observation, questioning, descriptive statistics, relationship diagrams, brainstorming, space allocation, and simulation as techniques for processing information for building design. Prerequisite: professional level standing.

433 Building Codes and Ordinances. (3) F, S
See PUD 433.

442 Site Planning Principles and Analysis. (3) S
Effects of topography, climate, energy, zoning and landscaping upon design development of external spaces. Programming and analysis, and integration of architectural design to the site and site to the region.

475 Computer Programming in Architecture. (3) F, S
Computer programming with FORTRAN for architectural problems and applications. Lecture/lab. Prerequisite: CSC 183 or equivalent.

477 Computer Applications to Environmental Design Problems. (3) F, S
Use of existing computer programs to solve environmental and design problems. Topics include graphics, mapping, structures, regional analysis, time management and energy analysis. One hour lecture/six hours lab. Prerequisite: approval of instructor.

530 Computer Graphics in Architecture. (3)
Fundamentals of computer graphics programming in architecture; including graphics hardware, device independent packages, two and three dimensional transformations and data structures. Two hours lecture/three hours lab. Prerequisite: ANP 475 or permission of instructor.

535 Building Programming. (3) F
Design problem definition including client interviews, literature review, user needs analysis, existing building evaluation, and program preparation. Prerequisite: Third Professional Level in Architecture or approval of instructor.

576 Community Housing. (3) F
History, practices, trends, and forms of housing; includes growth of public programs, national and local programs, zoning law, housing distribution, planning principles and policies, design review, standards and private development practice.

577 Housing Environments. (3) S
Contemporary housing environments, housing types and life styles as determined by user preference, density, development and property standards, cost, community and privacy, security, identity, movement and the need for open space.

581 Urban Structure and Design. (3) F
The nature and dynamics of urbanization and its relationship to architecture and urban design; including growth, decay, socialization, planning processes, and visual perception. Case studies. Prerequisite: professional level standing.

681 Professional Seminar: Societal Influences of Architectural Practice. (2) F
Examination of legal, moral, and ethical issues confronting the practice of architecture. Alternative approaches in practice. Assessment of potential changes in the profession. Prerequisite: approval of instructor.

682 Architectural Theory and Criticism. (2) S
Attitudes of evaluation of the built environment. The philosophical basis for aesthetic judgements. Methods and styles of criticism and architectural journalism on a comparative basis. Prerequisite: approval of instructor.

ARCHITECTURAL PHILOSOPHY AND HISTORY

APH 100 Introduction to Environmental Design I. (2) F, S
Survey of environmental design: includes historic examples and the theoretical, social, technical, and environmental forces that shape them. Cross listed with DSC 100, PUP 100.

101 Introduction to Environmental Design II. (2) F, S
Survey of environmental design issues, responsibilities, and directions. Cross listed with DSC 101, PUP 101.

200 History of Human Environments I. (3) F
Representative works of western and eastern designed environments, including artifacts, products, technological devices, furnishings, buildings, and the development of the city through the medieval period. Cross listed with DSC 200, PUP 200.

201 History of Human Environments II. (3) S
Designed human environments including their technology and components from the Renaissance to the present day, as represented by various western and eastern cultures. Cross listed with DSC 201, PUP 201.

300 World Architecture I/Western Cultures. (3) F
Historical and contemporary built environments of Western civilizations: Mediterranean, Europe and the Americas as manifestations of cultural history and responses to environmental determinants. Non-architecture majors only.

301 World Architecture II/Eastern Cultures. (3) S
Historical and contemporary built environments of Eastern civilizations: Mid-East, Central Asia, Far East and South Pacific as manifestations of cultural history and responses to environmental determinants.

304 American Architecture. (3) N
Architecture in the U.S. from earliest colonial times to present. Non-architecture majors only.

305 Contemporary Architecture. (3) N
Europe and America from the foundations of the modern movement to the present. Non-architecture majors only.

311 Survey of Mexican Architecture. (2) N
Overview of historical through contemporary example of Mexican architecture, landscape, and urban design.

313 History of Western Architecture I. (3) F, S
Representative works of western architecture, ancient through medieval. Three hours lecture.

314 History of Western Architecture II. (3) S
Architecture of the Renaissance to the end of the 19th century. Three hours lecture.

348 Theory of Built Environments. (3) N
Focused study of built environmental forms, their theoretical foundation and relation to social processes. Prerequisite: sophomore standing. Cross listed with DSC 348, PUP 348.

441 Ancient Architecture. (3) N
The ancient Mediterranean world, with selective emphasis on major historical complexes and monumental styles. Prerequisite: DES 313 or APH 313.

443 Renaissance Architecture. (3) N
Europe and America in the 15th and 16th centuries. Prerequisite: DES 313 or APH 313 or DES 314 or APH 314.

444 Baroque Architecture. (3) N
Europe and America from the late 16th to the middle 18th century. Prerequisite: DES 314 or APH 314.

445 19th Century Architecture. (3) N
Europe and America from neoclassicism to art nouveau. Prerequisite: DES 314 or APH 314.

446 20th Century Architecture I. (3) F
Architecture in Europe and America from the foundations of the modern movement to the culmination of the international style. Prerequisite: majors only.

447 20th Century Architecture II. (3) S
Developments in architecture since the international style. Prerequisite: APH 446.

682 Architectural Theory and Criticism. (2) S
Attitudes of evaluation of the built environment. The philosophical basis for aesthetic judgments. Methods and styles of criticism and architectural journalism on a comparative basis. Prerequisite: approval of instructor.

ARCHITECTURAL TECHNOLOGIES

ATE 351 Environmental Control Systems I. (3) F
Architectural design implications of solar radiation, heat and moisture transfer. Trends in environmental control and energy-conscious design. Passive techniques to heat, cool and light. Two hours lecture/three hours lab. Prerequisite: professional level standing.

353 Architectural Construction I. (3) F
Basic materials and methods of architectural construction for residential scaled systems. Includes effect of zoning and code requirements. Prerequisite: professional level standing.

361 Building Structures I. (3) F
Statics, dynamics and strength of materials. Elasticity of structural materials, properties of sections, elastic stress analysis of determinate structures, computer applications. Preliminary design of simple structural systems. Prerequisite: professional level standing.

362 Building Structures II. (3) S
Analysis and design of wood and masonry structural systems and connections. Lateral analysis and design, utilizing shear walls and diaphragms in small structures. Prerequisite: ATE 361.

451 Architectural Construction II. (3) F
Selection and employment of materials and systems according to their nature and the techniques of their use, and basic construction cost estimating procedures for architects. Prerequisite: ATE 353.

452 Environmental Control Systems II. (3) S
Architectural design implications of HVAC systems. Heating and cooling loads, psychrometrics, the refrigeration cycle, air/water distribution, control systems, energy performance standards and utility rates. Two hours lecture, three hours laboratory and field trips. Prerequisite: ATE 351.

461 Building Structures III. (3) F
Analysis, design and detailing of steel buildings and frames. Lateral analysis of small rigid and braced frame systems. Prerequisite: ATE 362.

462 Building Structures IV. (3) S
Analysis, design and detailing of concrete systems, considering continuity, multi-story frames and shear walls, and lateral analysis. Computer application using existing programs. Prerequisite: ATE 461.

551 Advanced Building Systems. (3) F
Techniques of analysis for determining appropriate passive and active methods of year around environmental control. Case studies and economic analysis of energy-efficient buildings. Prerequisite: ATE 352.

553 Building Systems I. (3) F
Principles of lighting, daylighting, and acoustics and their application in the design of buildings. Prerequisite: professional level standing or approval of instructor.

557 Construction Documents I. (3) F
Production of architectural working drawings; legal status organization, layout, site survey plans, sections, el-

evations, details, schedules, and coordination. Laboratory/lecture.

558 Construction Documents II/Specifications and Cost Analysis. (3) S
Coordination of working drawings with preparation of construction specifications and cost estimates. Emphasis on alternative methods and office procedures. Contract conditions, bonds, and bidding procedures. Prerequisite: ATE 557.

563 Soil Mechanics and Foundations. (3) S
Soil characteristics, elementary soil mechanics, survey of site exploration and lab testing, bearing foundations and retaining structures. Prerequisite: ATE 361 or approval of instructor.

582 Building Systems II. (3) S
Design of building systems including: electrical, plumbing, security, communications, fire protection and transportation. Field trips. Two hours lecture/three hours lab. Prerequisite: ATE 352, ATE 553.

587 Building Systems III. (3) F
Principles of planning and design of appropriate environmental control, structural, vertical transportation and fire protection systems for high rise and large building complexes. Prerequisites: ATE 352, 582.

588 Building Structures V. (3) F
New developments in high rise structural systems. Effects of wind and seismic forces. Preliminary analysis, design and detailing of tall buildings using code requirements and computer applications. Lecture/lab. Prerequisite: ATE 462.

ARCHITECTURAL COMMUNICATION

AVC 141 Design Graphics. (2) F, S, SS
Orthographic, paraline, axonometric, and perspective projection, shades and shadows, and basic descriptive geometry for designers. One hour lecture, four hours studio. Prerequisite: Major in college. Cross listed with DSC 141, PUP 141.

160 Freehand Perspective Drawing I. (2) F, S, SS
Freehand perspective drawing methods applied to drawing objects and interior and exterior environments in line and tone. One hour lecture, four hours studio. Prerequisite: Major in college. Cross listed with DSC 160, PUP 160.

161 Freehand Perspective Drawing II. (2) F, S, SS
Continuation of AVC 160. Introduction of color media, and analytical and design drawing exercises. Four hours studio. Prerequisite: Major in college, AVC 160. Cross listed with DSC 160, PUP 161.

301 Architectural Communication I. (2) F
Basic graphic skills, drawing conventions, values, graphic symbols and lettering, sketching and presentation vocabulary. Two afternoons in laboratory per week. Lecture and field trip. Prerequisite: professional level standing.

302 Architectural Communication II. (2) S
Continuation of AVC 301. Introduction to theory and effects of color. Prerequisite: AVC 301.

410 Architectural Presentation Techniques. (3) F, S
Special techniques of graphic communications as preliminary presentation tools for the design professional. Prerequisite: AVC 301 or approval of instructor.

411 Architectural Watercolor Presentation Techniques. (2) N
Introduction of architectural presentation techniques using watercolor as a primary media. Emphasis on color, composition, and technique. Prerequisite: AVC 301 or approval of instructor.

444 Architectural Photography. (2-3) N
Use of photography as a means of architectural study, evaluation and record. Experience with both 35mm camera and darkroom techniques. Lecture/Laboratory. Prerequisite: approval of instructor.

PROFESSIONAL STUDIES

ARP 451 Architecture Field Studies. (1-6) F, S, SS
Organized field study of architecture in specified national and international locations. May be repeated with approval of chair.

484 Clinical Internship. (3) SS
Full-time internship under the supervision of practitioners in the Phoenix area or other locales.

684 Professional Internship. (2-6) S
Field experience in an architectural firm specializing in an area directly related to the student's advanced study. Integration of theory and state-of-the-art practices. By approval of instructor only.

Special Courses: APH, ANP, ATE, ADE, AAD, ARP, AVC, EDE, ETE—294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. See pages 35-36. Also consult Off-Campus Academic Services brochures for special course offerings.

SOLAR ARCHITECTURE AND TECHNOLOGY

EDE 532 Earth Sheltering Techniques. (3) S
Principles of earth sheltering for energy conscious building, including orientation, structure, insulation, moisture proofing and building codes. Prerequisite: ETE 551.

661 Climatic and Solar Design. (4) F
Laboratory and field experience in architectural synthesis emphasizing climatic criteria and analysis with emphasis on appropriate technology and passive thermal systems. Prerequisite: First professional degree or approval of instructor.

662 Energy Efficient Design and Planning. (4) S
Laboratory and field experience in energy efficient design emphasizing solar energy and related renewables in urban and institutional complexes for comfort prototypes. Prerequisite: EDE 661.

Special Graduate Courses: See pages 35-36 for special graduate courses which may be offered by this academic unit.

ENERGY PLANNING AND TECHNOLOGY

ETE 501 Introduction to Solar Energy. (3) S
Introduction to theoretical and practical aspects of use of solar radiation and nocturnal cooling for control of building environments.

511 Energy Environment Theory. (3) F
Historical, contemporary and practical influences of solar and other resource systems on the designed environment; architectural, landscape, urban and regional implications of resource strategies, other renewable resources.

521 Solar Energy Technology. (3) F
Utilization of solar radiation and nocturnal cooling for heating and cooling buildings in arid and other regions. Prerequisite: MAT 115.

522 Desert Habitation Technology. (3) F
Analysis of habitation approaches in nontechnological and technological societies arising from the nature of desert areas. Prerequisite: ATE 352.

541 Solar Collector and Storage Design. (3) F
Fundamental understanding and practical applications of solar energy collectors and storage to buildings is

emphasized. Prerequisite: MAT 290, MET 380, ETE 521.

542 Building Thermal System Simulation and Optimization. (3)
Mathematical models of building envelope and comfort conditioning systems will be developed to simulate building energy systems; optimization techniques are also presented. Prerequisite: ETE 541.

544 Solar Thermal Subsystem Design. (3) S
Fundamental understanding and practical applications of solar subsystems such as controls, heat exchangers, heat transfer fluids in buildings is emphasized. Prerequisite: ETE 541.

551 Passive Building Performance I. (3) F
Current handbook and hand-held calculator evaluation techniques to determine environmental influence on comfort in small passive heated and cooled buildings. Prerequisite: MAT 115, ATE 352.

552 Passive Building Performance II. (3) S
Advanced computer-aided evaluation techniques to determine environmental influence on comfort in large passive heated and cooled buildings. Prerequisite: ETE 551, CSC 183.

553 Energy Conservation in Buildings. (3) S
Impact of natural forces on the design of buildings, emphasizing pre-design decisions and post-construction practices leading to minimum energy consumption. Investigation of new energy sources. Prerequisite: ETE 541, CSC 183, ATE 352.

558 Energy Parameters for Buildings. (3)
Evaluation techniques for identifying energy-related design parameters of climate, site, functional usage, layout, electrical, daylighting, auxiliary systems, controls, material specifications, costs, detailing on large non-residential buildings. Two hours lecture/three hours lab. Prerequisite: ETE 551 or approval of instructor.

560 Advanced Computer-Aided Energy Analysis. (3)
Develop new and advanced algorithms to analyze environmental problems with emphasis on energy performance. Topics include: climatic, bioclimatic, lighting, acoustics, passive solar and HVAC systems. Two hours lecture/three hours lab. Prerequisite: ANP 475 or ANP 477, ATE 352.

562 Energy Efficient Systems Evaluation. (3) S
Field performance data of active and passive solar systems and components is compared with fundamental principles and formulations. Prerequisites: ETE 521, ETE 551.

Department of Design Sciences

PROFESSIONAL PROGRAMS

Purpose

Professional designers work within areas requiring an understanding of systems, functions, scientific and technical processes including human factors. They must also integrate esthetic considerations into the products and spaces for which they design.

Organization

The professional programs within the Department of Design Sciences are organized under the direction of the chair. The following majors are offered:

Industrial Design
Interior Architecture
Design Science

Curriculum

The professional design curricula concentrate and combine fully-integrated lecture, laboratory, and studio course work involving both individual and team experiences. The curricula are further directed at providing students the skills and facilities required for the practice of design or design-related careers.

All programs assume each student will acquire a broad foundational education and provides for applications of this education. The program thrust is toward acquiring competency in professional skills in a rapidly changing and increasingly competitive technological society.

One summer of internship in design-related activities under the direction of an approved preceptor is required and provides a distinct educational experience.

Admission. Students are admitted to the Department of Design Sciences upon approval of admission to Arizona State University and the College of Architecture and Environmental Design.

Retention Standards. To be eligible to continue in professional programs in the Department of Design Sciences, a student must remain in good standing as established by the University and the College of Architecture and Environmental Design.

Entry into Upper Division Studio Courses. Students who have completed the lower division curriculum requirements may apply for acceptance to upper division programs in industrial design, interior architecture or design science. Students not accepted to upper division and who wish to reapply to programs may take upper division lecture courses, but may not take upper division studio or lab courses.

Non-admission to upper-division studio courses does not constitute dismissal from the program. Any student not so admitted may apply in subsequent years without prejudice.

Application Procedures. Students should write to the Academic Advisor for the appli-

cation form well in advance of the application deadline.

Deadlines and Schedule:

Application deadline: 4:00 p.m. April 15 (or the following Monday if the 15th falls on a weekend). All material in the application format described below.

Spring semester transcripts: June 15.

Notification: July 1.

Return of Letter of Acceptance: A signed receipt of acceptance of admission must be received by the department July 15.

Alternates: July 16, notification of admission status for alternates.

Portfolios available for return: July 16.

Matriculation: Accepted students are expected to begin their upper division programs at the beginning of the immediate fall term. There is no spring admission to the upper division.

Application Format. Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves (8 1/2" x 11" format only.) Items must appear in the following order:

Page 1 - Department application form completely filled out with page 1 visible.
Page 2 - Department application forms with page 2 visible.
Page 3 - High school transcripts from all schools attended.
Page 4 - Certificate of ACT, SAT, GRE, or TOEFL test scores, as applicable.
Page 5 - College transcripts from all schools attended showing completion of lower division program requirements. Note: Transcripts should be complete except for the current Spring semester. Spring semester transcripts must be received by the Department before June 15.
Page 6 - Copy of Arizona State University Certificate of Admission.
Pages following - Examples of the applicant's graphic skill and creative ability:

A. Include 2-3 examples from each of the lower division studio courses (141, 160, 161, 221, 222) or work from similar courses taken elsewhere. Include a one sentence caption that briefly explains each project being illustrated, the educational goal, the length of time allotted for the project, and, as applicable, names of other team members, and so forth.

B. You may include additional materials, written or pictorial, that you feel provide additional evidence of your skills and abilities, as well as aptitude and commitment to your field of professional study. For applicants to the departments of Design Science or Planning, this section may include letters of recommendation.

When any work is not completely original, the source must be given. When work is of a team nature, the applicant's role in the project should be clearly indicated. Original examples or slides *must not* be submitted. All examples must be photographs or other reproduction graphic media.

Return of Application Materials. The Department Application Form remains the property of the department, however the rest of the materials will be returned after July 15 if the applicant encloses a self addressed return mailer with sufficient prepaid postage. The applicant may also receive it in person at the department office or if he/she provides written authorization for someone to receive it in person at the departmental office. After one year the remaining materials are discarded. The college and the departments assume no liability for lost, damaged or unclaimed materials.

Professional Curricula

Bachelor of Science in Design

A student seeking the Bachelor of Science in Design degree within the Department of Design Sciences must satisfactorily complete a minimum planned curriculum of 134 semester hours.

The program includes various required and optional field trips. (Supplemental fees are assessed for these offerings). In addition, foreign study opportunities are available for honor students.

Industrial Design

Industrial design is primarily concerned with how humans perceive and use man-made objects, and has been defined as the professional service of creating and developing concepts and specifications that optimize the appearance, function, and value of products and systems for the mutual benefit of both the user and the manufacturer.

This service is often provided in the context of a cooperative working relationship with other members of a development group. The industrial designer's contribution places special emphasis on human

characteristics, needs, and interests which require particular understanding of visual, tactile, safety, and convenience criteria. Industrial designers combine these considerations with practical concern for technical processes and requirements for manufacture; marketing opportunities and economic constraints; and distribution, sales, and servicing arrangements.

Curriculum. At the lower division level the curriculum balances a foundation in academic subjects such as English, math, computers and physics with a core of design course that include history as well as studio courses in drawing, graphics, and design fundamentals. At the upper division level the curriculum includes both studio and laboratory work in industrial design, color theory, and materials, and manufacturing techniques, as well as lecture courses in human factors, graphic design, design methods and practice. A summer internship is also part of the program.

The upper division curriculum emphasizes studio projects which promote an interdisciplinary approach to solving problems and is based on an intellectual understanding of the philosophy and direction of industrial design. Problems proceed from small consumer products with simple task functions to larger and more complex problems and systems. Studio projects also emphasize the design process and sudent's progress through its stages including: problem analysis and statement, concept ideation, final product development, presentation, and packaging.

Graduates of the program accept entry positions in industry and firms doing product and packaging design. They may focus on consumer products, transportation, electronics, medical devices, health products, recreational products, or materials application.

Computer Graphics Concentration. With approval of the department chair, students in the upper division industrial design program work with an advisor to select approved program electives that will provide them with a working knowledge of computer graphics in the field of industrial design.

Emphasis is on mastering computer graphics that help a student represent, visualize and analyze products through computer drawn plans, elevations, perspectives as well as the use of programs that perform scaling, stacking and rotating routines.

Professional Studies—Required Courses

Industrial Design

First Year

			Semester Hours
Fall			
ENG	101	Freshman Composition	3
COM	110	Personal Relationship Communication	3
MAT	115	College Algebra and Trigonomety	4
DSC	100	Introduction to Environmental Design I	2
DSC	141	Design Graphics	2
DSC	160	Freehand Perspective Drawing I	2
			16
Spring			
ENG	102	Freshman Composition	3
PHY	111	General Physics	3
PHY	113	Laboratory	1
CSC	181	Basic	3
DSC	101	Introduction to Environmental Design II	2
DSC	161	Freehand Perspective Drawing II	2
		Approved Program Elective	2
			16

Second Year

Fall			
DSC	226	Color Sketching	3
DSC	224	Color	3
DSC	316	20th Century Design I	3
DSC	342	Materials	3
DSC	221	Design Fundamentals	3
PGS	100	Introduction to Psychology	3
			18
Spring			
DSC	317	20th Century Design II	3
MET	343	Material Processes	3
ECN	112	Microeconomic Principles	3
DSC	225	Design Methods	3
		General Studies Elective	3
			15

Third Year

Fall			
DSC	344	Human Factors in Design	3
MET	354	Mechanics of Materials	4
DSC	360	Design Methodology and Techniques	5
		Approved Program Elective	3
		General Studies Elective	3
			18

Spring			
DSC	323	Imaging and Presentation for Visual Designers	3
DSC	361	Concept Development	5
DSC	440	Plastics Design	3
DSC	443	Value Analysis	2
		General Studies Elective	3
			16
Summer			
DSC	484	Internship	3

Fourth Year

Fall			
DSC	420	Graphic Design	3
DSC	460	Unit Analysis and Design	5
DSC	470	Professional Practice for Industrial Design	3
DSC	474	Design Project	3
		General Studies Elective	3
			17
Spring			
DSC	431	Package Design	3
DSC	441	Product Liability	2
DSC	461	Systems Synthesis and Design	5
DSC	475	Design Project	3
		Approved Program Elective	3
			16
		Total Credit Hours	135

General Studies Requirements, Industrial Design

Humanities and Fine Arts			
COM	110	Personal Relationship Communication	3
DSC	100	and 101 Introduction to Environmental Design I, II	4
Social and Behavioral Science			
PGS	100	Introduction to Psychology	3
ECN	112	Microeconomic Principles	3
Science and Mathematics			
MAT	115	College Algebra and Trigonometry	4
PHY	111	General Physics	3
PHY	113	Laboratory	1
CSC	181	Basic	3
		General Studies Electives	12
		Total	36

Interior Architecture

The dramatic changes in the interior design profession over the last two decades are reflected in the interior architecture program. The curriculum emphasizes the design, technical, problem solving and management skills needed to work in collaboration with the allied environmental design professions and to provide high quality environments for human use.

Curriculum

At the lower division level the curriculum balances a foundation in academic subjects such as English, math, computers, and physics with a core of design courses that include history, as well as studio courses in drawing, graphics, and design fundamentals. At the upper division level the curriculum includes both studio and laboratory work in interior design and color theory as well as drawing and lecture courses in human factors, environmental technologies, history, and practice. A summer internship is also a part of the program.

Graduates from the program accept entry level professional positions in a variety of settings including interior design firms, departments of space planning or interior design in corporations or public institutions, as well as industry. Students may also choose to continue their education with specialized study in interior architecture or the allied design professions.

Professional Studies—Required Courses

Interior Architecture

First Year

			Semester Hours
Fall			
ENG	101	Freshman Composition	3
COM	110	Personal Relationship Communication	3
MAT	115	College Algebra and Trigonometry	4
DSC	100	Introduction to Environmental Design I	2
DSC	141	Design Graphics	2
DSC	160	Freehand Perspective Drawing I	2
			16
Spring			
ENG	102	Freshman Composition	3
PHY	111	General Physics	3
PHY	113	Laboratory	1
CSC	183	Programming in FORTRAN	3
DSC	101	Introduction to Environmental Design II	2
DSC	161	Freehand Perspective Drawing II	2

		Approved Program Elective	2
			16

Second Year

Fall

DSC	246	Interior Architectural Programming	3
DSC	221	Design Fundamentals I	3
DSC	316	20th Century Design I	3
DSC	344	Human Factors in Design	3
DSC	224	Color	3
		General Studies Elective	3
			18

Spring

DSC	220	Interior Architectural Rendering	3
DSC	222	Design Fundamentals II	3
DSC	225	Design Methods	3
DSC	317	20th Century Design II	3
		General Studies Elective	3
			15

Third Year

Fall

DSC	340	Interior Materials Performance Criteria I	3
DSC	346	Furniture & Millwork Design	3
DSC	364	Human Habitation Space Design	5
DSC	416	History of Interior Architecture I	3
ATE	353	Architectural Construction I	3
			17

Spring

DSC	321	Interior Architectural Documents	3
DSC	341	Interior Materials Performance Criteria II	3
DSC	365	Community Space Design	5
DSC	417	History of Interior Architecture II	3
DSC	458	Interior Architectural Lighting	3
			17

Summer

DSC	484	Internship	3

Fourth Year

Fall

DSC	455	Environmental Control Systems	3
DSC	464	Commercial Space Design	5
DSC	472	Professional Practice for Interior Architecture	3
PGS	306	Environment Psychology	3
		Social and Behavioral Science Elective	3
			17

Spring

DSC	457	Interior Architectural Acoustics	3
DSC	465	Institutional Space Design	5
		Approved Program Electives	3
		Social and Behavioral Science Elective	3
		General Studies Elective	3
			17
		Total Credit Hours	135

General Studies Requirements, Interior Architecture

Humanities and Fine Arts

COM	110	Personal Relationship Communication	3
DSC	100	and 101 Introduction to Environmental Design I, II	4

Social and Behavioral Science

PGS	306	Environmental Psychology	3
Elective			6

Science and Mathematics

MAT	115	College Algebra and Trigonometry	4
PHY	111	General Physics	3
PHY	113	Laboratory	1
CSC	183	Programming in Fortran	3
		General Studies Electives	9
		Total	36

Design Science

The design science major is an individualized program of study for students who have specific academic and professional goals that are not achievable in the department's curriculum. Applications for acceptance in the design science program is made directly to the department chair. Design science majors do not take studio or lab courses. An internship may be a part of each program of study.

Applications must include a program of study developed in conjunction with an advisor and accepted by the faculty. Students must fulfill lower division program requirements in either industrial design or interior architecture and the program must total 135 hours.

Decorative Arts Concentration: As a concentration within the College of Architecture and Environmental Design, the decorative arts concentration develops an awareness of the interaction between human

behavior and the physical environment through the study of the social and physical sciences and the humanities.

The decorative arts concentration will be of interest to students who are seeking leadership positions in a product producing industry where an understanding of the technical, business and design aspects of product or production are essential. Students completing the concentration will be prepared for graduate study in business, design history or a first professional degree in one of the environmental design disciplines.

Human Factors Concentration

Designers of products and environments rely on accurate data on humans called human factors. This includes data on human size and the way humans use tools, equipment, furnishings, and space. A student's proposed program of study in this area would typically include course work in design methods, research methods, statistical analysis, ergometrics, human factors, and bio mechanics, as well as selected courses in interior architecture and industrial design.

Design Sciences

PROFESSIONAL PROGRAMS

PROFESSOR:
REZNIKOFF

ASSOCIATE PROFESSORS:
WITT (Arch 141), BUSH, KNIGHT, KROELINGER, NIELSEN, STREUFERT

ASSISTANT PROFESSORS:
PAPIER, QUESADA, SADLER

DESIGN SCIENCES

DSC 100 Introduction to Environmental Design I. (2) F, S
Survey of environmental design: includes historic examples and the theoretical, social, technical, and environmental forces that shape them. Two hour lecture. Cross-listed with APH 100, PUP 100.

101 Introduction to Environmental Design II. (2) F, S
Survey of environmental design issues, responsibilities, and directions. Two hours lecture. Cross-listed with APH 101, PUP 101.

141 Design Graphics. (2) F, S, SS
Orthographic, paraline, axonometric, and perspective projection, shades and shadows, and basic descriptive geometry for designers. Five hour studio. Prerequisite: Major in College. Cross-listed with PUP 141, AVC 141.

160 Freehand Perspective Drawing I. (2) F, S, SS
Freehand perspective drawing methods applied to drawing objects and interior and exterior environments in line and tone. Five hour studio. Prerequisite: Major in College. Cross-listed with AVC 160, PUP 160.

161 Freehand Perspective Drawing II. (2) F, S, SS
Continuation of 160. Introduction of color media, and analytical and design drawing exercises. Five hour studio. Prerequisite: Major in College, DSC 160. Cross-listed with AVC 161, PUP 161.

200 History of Human Environments I. (3) F
Representative works of western and eastern designed environments, including artifacts, products, technological devices, furnishings, buildings, and the development of the city through the medieval period. 3 hours lecture. Cross-listed with APH 200, PUP 200.

201 History of Human Environments II. (3) S
Designed human environments including their technology and components from the Renaissance to the present day, as represented by various western and eastern cultures. 3 hours lecture. Cross-listed with APH 201, PUP 201.

212 Decorative Arts/Cultural Influences. (3) F, S
Focus on how diverse cultures have expressed themselves through the decorative arts. May include field trips.

220 Interior Architectural Rendering. (3) F
Graphic representation methods used to describe and analyze space, emphasis on quick presentation techniques. Prerequisites: DSC 161, 221; six hours studio.

221 Design Fundamentals I. (3) F
Exercises in basic visual organization: includes design vocabulary, principles of 2D and 3D composition, color, and aesthetic reactions to design. Seven hour studio . Prerequisite: Major in College. Cross-listed with ADE 221, PUP 221.

222 Design Fundamentals II. (3) S
Application of design fundamentals to environmental design problems. Introduces human scale, performance criteria, functional and aesthetic spatial organization and movement. Seven hour studio. Prerequisite: Major in College, DSC 141, DSC 160, DSC 221. Cross-listed with ADE 222, PUP 222.

223 Decorative Arts/Basic Design.(3) F, S
Elements and principles of design as they relate to the physical environment. Majors only or approval of instructor. May include field trips. Prerequisite: DSC 141 or equivalent. 2 hours lecture, 2 hours studio.

224 Color. (3) F, S
Theory and practice of basic color concepts, color systems, color relationships, psychology of color, color in industry. Prerequisite: DSC 161 or equivalent. 2 hours lecture, 2 hours studio.

225 Design Methods. (3) S
Issues of physical form development related to product and interior design; form development properties of paper, fibers, wood, metal and plastics. Prerequisite DSC 221 or equivalent. Majors only. 2 hours lecture, 2 hours studio.

226 Color Sketching. (3) F, S
Felt markers; quick representational and concept communication sketching. Forms in space; light and shade. Material reflectance properties. Prerequisite DSC 161 or equivalent; six hours studio.

228 Electronic Imaging. (3) S, F
Introduction to the technologies involved in the production of computer graphics for designers in a non-technical format. 1 hour lecture, 4 hours studio.

246 Interior Architectural Programming. (3) F
Design programming and methodologies for interior architecture; emphasis on user needs and behavior as a basis for design. Three hours lecture, field trips.

316 20th Century Design I. (3) F
Modern European and American design from 1900 to 1940. Emphasis on transportation, product, furniture, exhibition and graphic design.

317 20th Century Design II. (3) S
Modern European, Asian and American design since 1940. Emphasis on transportation, product, furniture, exhibition and graphic design.

321 Interior Architectural Documents. (3) S
Contract documents, specifications, schedules and bidding procedures. Prerequisite: DSC 364 or approval of instructor.

323 Imaging and Presentation for Visual Designers. (3) S
Technique of product presentation for portfolio and corporate communication. Methods include advanced technology for concept, information dissemination, including computer imaging. Prerequisites: DSC 221, CSC 181. 6 hours studio.

340 Interior Materials Performance Criteria I. (3) F
General analysis of interior architectural materials and performance criteria. Prerequisite: DSC 221 or equivalent.

341 Interior Materials Performance Criteria II. (3) S
Codes and regulations as performance criteria for interior architecture. Prerequisite: DSC 340.

342 Materials. (3) S
Materials application in design. Characteristics and properties of ferrous and nonferrous metals, plastics and elastomers.

343 Material Processes. (3) F
Industrial processing as applied to low, medium and high volume manufacturing. Basic and secondary processing, fastening and joining, coding, quality control. (also listed as MET 343). Prerequisite: DSC 342.

344 Human Factors in Design. (3) F
Man-machine environment systems; human characteristics and behavior applied to design of products, systems and their operating environment.

345 Decorative Textiles. (3) S
Investigation of the fabrication and aesthetic qualities of textiles. Cultural and historical expression of design as related to interiors. Prerequisite: DSC 212 or approval of instructor. May include field trips.

346 Furniture and Millwork Design. (3) S
Design, construction, cost estimating and installation of interior furniture and millwork. Prerequisite: Departmental approval. One hour lecture, four hours studio.

347 Interior Furnishings. (3) F, S
Evaluation of furnishings designed for the home in a functional, economic and aesthetic framework. Prequisite: DSC 223, TXC 223. May include field trips.

348 Theory of Built Environments. (3) N
Focused study of built environmental forms, their theoretical foundation and relation to social processes. Prerequisite: Sophomore standing. Three hours lecture. Cross-listed with APH 348, PUP 348.

354 Mechanics of Materials. (4) S
Vectors, force systems, friction, equilibrium, centroids, and moment of inertia. Concepts of stress, strain, and stress analysis applied to beams, columns, and combined loading (also listed as MET 354). Prerequisites: PHY III, MAT 115.

360 Design Methodology and Techniques. (5) F
Acquaints the student with methods of visual thinking, conceptualization, and ideation while building skill levels in professional design presentation techniques. Prerequisite: departmental approval. Ten hour studio.

361 Concept Development. (5) S
Emphasis on developing ideas into a complete functional product, including survey and application of esthetics, human factors, materials and manufacturing. Prerequisite: DSC 360. Ten hour studio.

364 Human Habitation Space Design. (5) F
Studio problems in interior architecture related to behavioral response in personal and small group spaces for static and mobile situations. Prerequisite: departmental approval. Ten hour studio.

365 Community Space Design. (5) S
Studio problems in interior architecture related to human privacy; emphasis on issues of public and private use of interior spaces. Prerequisite: DSC 364. Ten hour studio.

367 Electronic Packaging. (3) N
Industrial design problems in packaging electronic devices. Emphasis is placed on packaging, displays, and controls. Prerequisite: approval of instructor.

414 History of Interior Furnishings I. (3) F
The design of furnishings as an expression of culture from antiquity to the 20th century.

415 History of Interior Furnishings II. (3) S
Design of furnishings as an expression of culture of the American periods and the 20th century. Prerequisite: DSC 414 or approval of instructor.

416 History of Interior Architecture I. (3) F
Historic design to 1700 as it affects interior architectural space: adaptation, restoration, preservation for residential, commercial, and institutional interiors.

417 History of Interior Architecture II. (3) S
Continuation of DSC 416 with emphasis on historic design from 1700 to the present. Prerequisite: DSC 416 or equivalent.

420 Graphic Design. (3) F
Visual design relating to products, packaging, display and signage. Mixed media. Prerequisite: DSC 323. Six hour studio.

431 Package Design. (3) S
Aesthetic and marketing considerations of containing, protecting and promoting a product through packaging. Prerequisite: DSC 420. Six hour studio.

440 Plastics Design. (3) S
Mold design for part requirements; molded holes; threads; inserts; fastening and joining; decorating; extrusion design; reinforced plastics. Prerequisite: DSC 224.

441 Product Liability. (2) N
Manufacturer's liability. Statutes, regulations and common law rules: role of expert witnesses; insurance and product safety programs.

443 Value Analysis. (2) N
Critical investigation of functions, cost and design-manufacturing interface in component development. Case histories.

447 Advanced Interior Furnishings. (3) F, S
Emphasis on furnishings and designing special activity areas in residential interior environments. Prerequisites: DSC 347, DEH 476. May include field trips.

454 Kitchen Design. (3) F, S
Holistic approach to the design of energy efficient residential kitchens including storage areas. Prerequisite: DSC 141 or equivalent.

455 Environmental Control Systems. (3) F.
Methods of specifying and constructing systems which control the sensory input from the ambient environment. Prerequisites: MAT 115, PHY 111, 113 and senior status. Field trips.

457 Interior Architectural Acoustics. (3) S
Physical properties of sound. Reflection, absorption and diffraction of sound waves. Sound-absorption materials and constructions. Room acoustics and resonance; diffusion and decay of sound. Optimum reverberation time. Acoustical defects and how to avoid them. Noise transmission. Prerequisites: MAT 115, PHY 111, 113, and senior status.

458 Interior Architectural Lighting. (3) S
Light as an aspect of interior architectural design. Developing brightness relationships in internal spaces; appraisal of alternatives. Daylight and electric light as a single system. Evaluation of light sources for distribution, color and cost. Prerequisite: senior status.

460 Unit Analysis and Design. (5) F
Complete analysis of the product unit as an element of mass production emphasizing marketing, packaging, cost development, esthetics and detailing. Special attention to professional presentation. Prerequisite: DSC 361. Ten hours studio.

461 System Synthesis and Design. (5) S
Product design with emphasis in systems interaction. Culmination of design process and technique. Individual project direction is encouraged. Prerequisite: DSC 460. Ten hours studio.

464 Commercial Space Design. (5) F
Studio problems in interior architecture related to commercial spaces such as restaurants, stores, business offices, banks, and hotels. Prerequisites: DSC 365. Ten hours studio.

465 Institutional Space Design. (5) S
Studio problems in interior architecture related to institutional spaces such as schools, hospitals, and health care facilities. Prerequisite: DSC 464. Ten hours studio.

470 Professional Practice for Industrial Design. (3) F
Business procedures, management techniques, accounting systems, ethical and legal responsibilities of the design professions. Prerequisite: senior status. May be repeated for credit.

472 Professional Practice for Interior Architecture. (3) F
Business procedures, project control, fee structures, professional product liabilities. Prerequisites; senior status.

474 Design Project. (3) F
Large-scale interdisciplinary class project involving project planning and control, design, prototype development, feasibility study and reporting. Prerequisites: senior status and approval of instructor.

475 Design Project. (3) S
Design finalization; model; final technical and summary reports; graphics; oral presentation of results. Prerequisite: DSC 474.

484 Internship. (3) SS
Full-time summer internship under supervision of practitioners in the Phoenix area or other locales. Prerequisite: approval of instructor.

518 Interior Architecture Adaptive Use. (3) S
Selected case studies of specific techniques and processes used in the renovation of interior spaces of existing structures for continued use or adaptive use. Prerequisite: DSC 416, 417, field trips.

519 Historic Restoration in Interior Architecture. (3) F
Selected case studies of specific techniques and processes used in the restoration of historically significant interior spaces. Prerequisites: DSC 416, 417, field trips.

552 Computer Applications for Interior Architecture. (3) F
Conferences and workshops directed toward the use of computer technology in the design process for space planning.

553 Computer Applications for Industrial Design. (3) F
Conferences and workshops directed toward the use of computer technology in the development of products for mass production.

554 Computer Applications for Design Science. (3) S
Conferences and workshops directed toward the use of computer technology in the students area of specialization.

558 Daylighting. (3) SS
Daylighting as a design determinant; concepts, techniques, methodology, experiments and case studies.

Special Courses: DSC—294, 394, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. See pages 35-36. Also consult Off-Campus Academic Services brochures for special course offering.

Department of Planning

Purpose

The Planning Department provides educational preparation for careers relating to urban and regional planning, landscape architecture and housing and urban development.

The undergraduate program leads to the four-year degree Bachelor of Science in Design (B.S.D.) with two majors and concentrations described below. The program prepares graduates for 1) employment in the area of concentration and 2) entrance into a professional graduate program at ASU or elsewhere. The graduate program leads to the two-year degree Master of Environmental Planning (M.E.P.).

Organization

The programs are organized under the direction of the chair and are administered by faculty advisers.

Bachelor of Science in Design

The Bachelor of Science in Design program has two two-year segments totaling 134 units of credit. Completion of requirements of the two-year 65 units of credit lower division pre-planning curriculum is required for all concentrations. The separate 69 units of credit upper division program requirements for the major and the concentrations in Housing and Urban Development, Landscape Architecture, and Urban Planning follow.

Lower Division Program Requirements—Pre-planning.

			Semester Hours
		English	
ENG	101	and 102 Freshman Composition OR	
ENG	105	Advanced Freshman Composition and approved Humanities and Fine Arts electives	6
		Humanities and Fine Arts	
PUP	100	Intro. to Environmental Design I	2
PUP	101	Intro. to Environmental Design II	2
		Electives: Art History, Foreign Languages, Dance History, English, Humanities, Music History, Philosophy, Religious Studies	6
		Social and Behavioral Sciences	
COM	311	Public Speaking OR other approved communication elective	3
ECN	112	Microeconomic Principles OR approved business course	3
		Electives: Anthropology (ASB), Cultural Geography, History, Journalism, Economics, Political Science, Business, Psychology (PGS), Public Affairs, Justice Studies, Sociology	6
		Science and Mathematics	
MAT	115	College Algebra and Trigonometry	4
		Approved Laboratory Science	4
CSC	183	Programming in FORTRAN (or ECE 105 Introduction to Languages of Engineering or other approved programming language)	3
		Electives: Anthropology (ASM), Botany, Chemistry, Computer Science, Engineering, Geology, Mathematics, Physical Geography, Physics, Psychology (PSY), Statistics, Zoology	6
		Other General Studies	
		Electives: Selected from the electives listed above for Humanities and Fine Arts, Social and Behavioral Sciences, Science and Mathematics	8
		Core	
PUP	141	Design Graphics	2
PUP	160	Freehand Perspective Drawing I	2
PUP	161	Freehand Perspective Drawing II	2
PUP	221	Design Fundamentals I	3
PUP	222	Design Fundamentals II	3
		Total	65

Major: Urban Planning

All students accepted to the upper division program take a core of courses in a single consolidated program. This core program includes a series of studio courses and lecture courses that introduce the skills, theory and history basic to the profession. The curriculum also includes an optional summer internship. Students use approved elective courses to fulfill requirements of one of the following concentrations: housing and urban development, landscape architecture, urban planning. A list of additional electives approved for all concentrations is available in the department office.

		Junior Year	Semester Hours
Fall			
PLA	361	Landscape Design I	6
PUP	401	Urban Design	3
PUP	421	Quantitative Methods	3
PUP	301	Introduction to Urban Planning OR	
PUP	403	Interdisciplinary Urban Planning	3
		Approved Elective	3
		Total	18
Spring			
PLA	362	Landscape Design II	6
PLA	494	Presentation Graphics	3
PUP	494	Use of Computers in Planning	3
		Approved Elective	3
		Approved Elective	3
		Total	18
Summer			
PLA	484	Clinical Internship OR	
PUP	484	Clinical Internship OR	
		Approved Elective	3
		Senior Year	Semester Hours
Fall			
PLA	461	Landscape Design III	6

	442	Preservation Planning OR	
PLA	411	History of Landscape Architecture	3
PLA	446	Planning, Society and Law	3
		Approved Elective	3
		Total	15

Spring

PLA	462	Landscape Architecture IV	6
PUP	414	History of the City	3
		Approved Elective	3
		Approved Elective	3
		Total	15

Total Semester Hours

Lower division program	65
Upper division program	69
Total	134

Major: Housing and Urban Development (HUD)

Provides familiarity with housing technology, planning and development in both public and private sectors. Any interested student should contact the department chair for information about the HUD major.

Major: Urban Planning

Concentration: Landscape Architecture (PLA)

Explores the reasons for and the techniques involved in the analysis, planning and design of land and the exterior environment, both natural and man-made. Students fulfill this concentration's requirements by taking their 21 credit hours of approved electives from the following list: 15 units of credit from the first list and 6 units of credit from the second list.

PLA	411	History of Landscape Architecture	3
PLA	431	Landscape Construction and Materials	3
PLA	432	Plant Materials	3
PLA	463	Landscape Construction Documents I	3
PLA	464	Landscape Construction Documents II	3

Select two courses from the following five courses:

CEE	341	Surveying	3
ENG	301	Writing for the Professions	3
ERA	325	Soils	3
GPH	372	Air Photo Interpretation	3
PLA	484	Clinical Intership	3

Major: Urban Planning

Concentration: Urban Planning (PUP)

Exposes the student to the theories, methods and interdisciplinary concerns of the urban planning profession. Students fulfill this concentration's requirements by taking their 21 credit hours of approved electives from the following list.

ENG	301	Writing for Professions	3
GPH	361	Urban Geography	3
GPH	371	Cartography	3
PUP	474	Urban Development Planning Applications	3
PUP	484	Clinical Intership	3
REA	441	Real Estate Land Development	3
SOC	332	The Modern City	3
TRA	405	Urban Transportation	3

Advisement

Advising for the lower division program is through the college academic adviser. Advising for the upper division professional program is by the department chair and faculty advisors.

Application and Admission

Admission to the department requires the completion of the following requirements and procedures.

Application to the University: see requirements and procedures given in the section titled "Undergraduate Admission" beginning on page 18.

Application to the lower division program of the Department of Planning: admission to the lower division program is automatic if it is requested on the application and admission to the University is granted.

Application to upper division programs in the Department of Planning: admission is limited to applicants who have completed the lower division program requirements and who are determined by the admissions committee to have the best potential for academic and professional success. Spaces in the program are limited by available facilities, faculty and qualified applicants. A lower division program GPA of 3.0 may be required.

Application Documents

Forms for admission to upper division professional programs of the department may be obtained from the Planning Department or from the academic advisor's office.

Application Procedures

Students should write to the Academic Advisor for the application form well in advance of the application deadline.

Deadlines and Schedule: *Application deadline:* 4:00 p.m. April 15 (or the following Monday if the 15th falls on a weekend). All material in the application format described below.

Spring Semester transcripts: June 15

Notification: July 1

Return of Letter of Acceptance: A signed receipt of acceptance of admission must be received by the department by July 15.

Alternates: July 16, notification of admission status for alternates.

Portfolios available for return: July 16

Matriculation: Accepted students are expected to begin their upper division programs at the beginning of the immediate fall term. There is no spring admission to the upper division.

Application Format

Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves (8 1/2″ x 11″ format only.) Items must appear in the following order:

Page 1-Department application form completely filled out with page 1 visible.

Page 2-Department application form with page 2 visible.

Page 3-High school transcripts from all schools attended.

Page 4-Certificate of ACT, SAT, GRE, or TOEFL test scores, as applicable.

Page 5-College transcripts from all schools attended showing completion of lower division program requirements. Note: Transcripts should be complete except for the current Spring semester. Spring semester transcripts must be received by the Department before June 15.

Page 6-Copy of Arizona State University Certificate of Admission.

Pages following -Examples of the applicant's graphic skill and creative ability:

A. Includes 2-3 examples from each of the lower division studio courses (141, 160, 161, 221, 222) or work from similar courses taken elsewhere. Include a one sentence caption that briefly explains each project being illustrated, the educational goal, the length of time allotted for the project, and, as applicable, names of other team members, and so forth.

B. You may include additional materials, written or pictorial, that you feel provide additional evidence of your skills and abilities, as well as aptitude and commitment to your field of professional study. For applicants to the departments of Design Science or Planning, this section may include letters of recommendation.

When any work is not completely original, the source must be given. When work is of a team nature, the applicant's role in the project should be clearly indicated. Original examples or slides *must not* be submitted. All examples must be photographs or other reproduction graphic media.

Return of Application Materials. The Departmental Application Form remains the property of the department, however the rest of the materials will be returned after July 15 if the applicant encloses a self addressed return mailer with sufficient prepaid postage. The applicant may also receive it in person at the department office or if he/she provides written authorization for someone to receive it in person at the departmental office. After one year the remaining materials are discarded. The college and the departments assume no liability for lost, damaged or unclaimed materials.

Inquiries

For further information on the lower division or upper division programs in planning, please contact the Academic Advisor, College of Architecture and Environmental Design, Arizona State University, Tempe, Arizona 85287. For further information on admissions to Arizona State University, contact: Office of the Director of Admissions, Arizona State University, Tempe, Arizona 85287.

Master of Environmental Planning

The Department of Planning offers an Urban Planning concentration in the Master of Environmental Planning degree (M.E.P.) offered by the College of Architecture and Environmental Design. This concentration is a two-year program with the following requirements:

	Semester Hours
Required Courses	18
Approved Electives	27
Optional Summer Internship	3
Thesis or Research Project	6
Total	54

Students with a terminal degree may be accepted into a program of study of 42-54 hours depending on their preparation. For further information, see the *Graduate College Catalog*.

Planning

PROFESSIONAL LEVEL PROGRAMS

PROFESSORS:
BURNS (ARCH 135), BOYLE, BURGESS

ASSOCIATE PROFESSOR:
LAI, LARSON

ASSISTANT PROFESSORS:
GARCIA, KIM

PROFESSOR EMERITUS:
ELMORE

URBAN PLANNING

PUP 100 Introducton to Environmental Design I. (2) F, S
Survey of environmental design: includes historic examples and the theoretical, social, technical, and environmental forces that shape them. Two hours lecture. Cross-listed with APH 100, DSC 100.

101 Introduction to Environmental Design II. (2) F, S
Survey of environmental design issues, responsibilities, *and directions. Two hours lecture. Cross-listed with* APH 101, DSC 101.

141 Design Graphics. (2) F, S, SS
Orthographic, paraline, axonometric, and perspective projection, shades and shadows, and basic descriptive geometry for designers. Five hour studio. Prerequisite: Major in College. Cross-listed with AVC 141, DSC 141.

160 Freehand Perspective Drawing I. (2) F, S, SS
Freehand perspective drawing methods applied to drawing objects and interior and exterior environments in line and tone. Five hour studio. Prerequisite: Major in College. Cross-listed with AVC 160, DSC 160.

161 Freehand Perspective Drawing II. (2) F, S, SS
Continuation of 160. Introduction of color media, and analytical and design drawing exercises. Five hour studio. Prerequisite: Major in College, PUP 160. Cross-listed with AVC 161, DSC 161.

200 History of Human Environments I. (3) F
Representative works of western and eastern designed environments, including artifacts, products, technological devices, furnishings, buildings, and the development of the city through the medieval period. 3 hours lecture. Cross-listed with APH 200, DSC 200.

201 History of Human Environments II. (3) S
Designed human environments including their technology and components from the Renaissance to the *present day, as represented by various western and* eastern cultures. 3 hours lecture. Cross-listed with APH 201, DSC 201.

221 Design Fundamentals I. (3) F
Exercises in basic visual organization: includes design vocabulary, principles of 2D and 3D composition, color, and aesthetic reactions to design. Seven hour studio. Prerequisite: Major in College. Cross-listed with ADE 221, DSC 221.

222 Design Fundamentals II. (3) S
Application of design fundamentals to environmental design problems. Introduces human scale, performance criteria, functional and aesthetic spatial organization and movement. Seven hour studio. Prerequisite: Major in College, PUP 141, PUP 160, PUP 221. Cross-listed with ADE 222, DSC 222.

300 The Planned Environment (3) F
Aesthetic, social, economic, political and other factors influencing urban development in the 20th century.

301 Introduction to Urban Planning. (3) F, S
Theoretical and practical aspects of city planning, emphasizing urban design. Interrelationships between physical planning, environment, government and society. See CEE 371.

348 Theory of Built Environments. (3) N
Focused study of built environmental forms, their theoretical foundation and relation to social processes. Prerequisite: Sophomore standing. Three hours lecture. Cross-listed with APH 348, DSC 348.

401 Urban Design. (3) F
Analysis of the visual and cultural aspects of urban design. Theories and techniques applied to selected study models.

403 Interdisciplinary Urban Planning. (3) F
Basic theories and methods of urban planning with introduction to substantive issues of concern to urban planners. Visiting lecturers.

414 History of the City. (3) S
The city from its ancient origins to the present day, emphasizing the cities of Europe and America during the last five centuries.

421 Quantitative Methods. (3) F
Tools useful for urban planning research; emphasis on demographic analysis and survey methods, including sampling, questionnaire construction, research design and data analysis.

442 Preservation Planning. (3)
Principles and practices in planning for preservation, conservation and neighborhood redevelopment. Emphasis on evaluation of historic resources. Off-campus field practicum required. Prerequisite: approval of instructor.

446 Planning, Society, and the Law. (3) F
Law as a determinant of urban planning and development both in history and in the context of present laws on police power, eminent domain, tax policy, and governmental programs.

451 Field Studies. (1-6) F, S, SS
Organized field study in specified national and international locations. May be repeated for credit.

474 Urban Development Planning Applications. (3) S
Applied methods and processes in land development planning. Environmental design and processes and transportation planning. Field trips.

484 Clinical Internship. (3) SS
Full-time internship under the supervision of practitioners in the Phoenix area or other locale.

512 Energy Policy Planning.
Energy conservation issues and strategies at the neighborhood to metropolitan scale. Prerequisite: ETE 521 or approval of instructor.

546 Planning and Development Control Law. (3) S
Case studies of the law affecting land development and public planning. Police power and eminent domain, zoning, subdivision controls, official mapping, urban renewal, housing, design controls, historic preservation, and exclusionary practices.

572 Interdisciplinary Urban Planning Practicum I. (3) S
Comprehensive planning workshop dealing with actual problems in an Arizona community. Data gathering and analysis, formulation and recommendation of alternative plans, policies, and strategies. Inclusive of interrelated social, economic, physical, and governmental considerations.

574 Interdisciplinary Urban Planning Practicum II. (3) N
Interdisciplinary workshop emphasizing large-scale, physical project planning in an urban, new community, regional context, with development by either a public agency or private enterprise. Development feasibility, urban and landscape design, housing, transportation, engineering, ecology, and regional planning.

672 Urban Statistical Analysis. (3) F
Quantitative analysis in the urban context, demographic analysis, data processing, planning application and urban systems.

674 Land Economics. (3) N
Economic determinants for urban and regional planning; analytical techniques, elementary market analysis and feasibility studies; economic incentives in urban planning.

676 Public Sector Planning. (3) S
Urban fiscal problems and public goods provision in state and local governments. Prerequisite: Admission to regular graduate student status and one undergraduate course in microeconomics.

678 Planning Theories and Processes. (3) F
Current theoretical developments related to social change perspectives; the role and ethics of planners. Prerequisite: Admission to regular graduate student status and one undergraduate course in economics, geography, sociology or political science.

HOUSING AND URBAN DEVELOPMENT

PUD 359 Tourist Resort Design. (3) F
Interrelationships of social, economic and physical aspects of total tourist resort design; emphasis on physical development of tourist centers and resort areas.

433 Building Codes and Ordinances. (3) F
Analysis of national, state and local building codes and ordinances relative to their impact in architectural programming design and construction documentation. See ANP 433.

442 Construction Administration II: Commercial. (3) S
Emphasis on field observation of construction, shop drawings, reports and materials testing. Meetings, records, field orders, schedules, arbitration of disputes, architect's responsibilities to client during construction, applications for payment and project closeout.

LANDSCAPE ARCHITECTURE

PLA 301 Introduction to Landscape Architecture. (3) F
The relevance of landscape architecture to the creation of humanized environments, with emphasis on natural factors.

361 Landscape Design I. (6) F
Landscape design; graphic skills, and principles of order applied to utilization of natural forms and materials. Field trips.

362 Landscape Design II. (6) S
Continuation of PLA 361, principles of landscape design, analysis and planning of landscape projects. Field trips.

411 History of Landscape Architecture. (3) F
Physical record of man's attitude toward the land. Ancient through contemporary landscape planning and design.

431 Landscape Construction and Materials. (3) S
Design, construction, materials and site engineering aspects of landscape architecture. Field trips.

432 Plant Materials. (3) S
Natural components of landscape design; characteristics, applications, selection and use. Field trips.

451 Field Studies. (1-6) F, S, SS
Organized field study in specified national and international locations. May be repeated for credit.

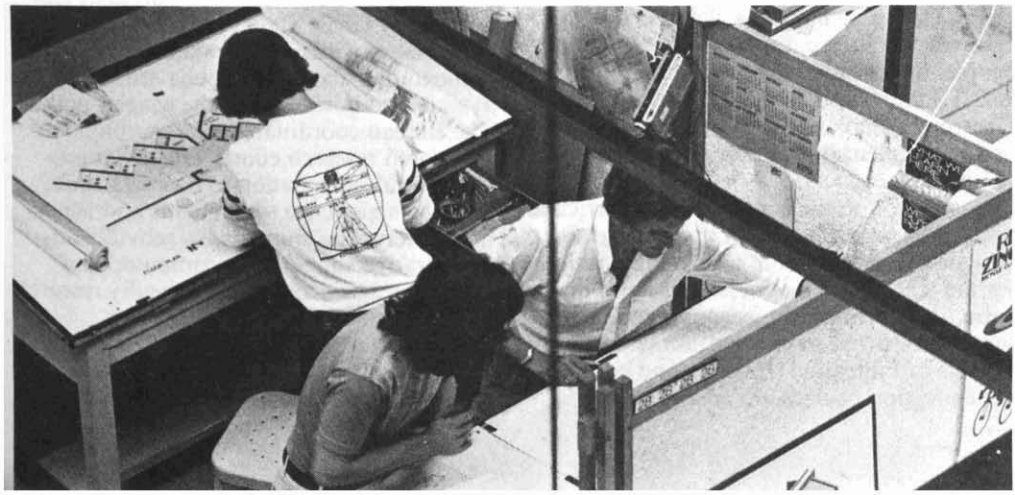
461 Landscape Design III. (6) F
Theory and methods of large-scale landscape design and planning. Field trips.

462 Landscape Design IV. (6) S
Continuation of PLA 461; design of landscape projects in arid regions. Field trips.

463 Landscape Construction Documents I. (3) F
Preparation of landscape construction drawings; legal status, organization, layout, site survey plans, sections, elevations, details, schedules and coordination.

464 Landscape Construction Documents II. (3) S
Continuation of PLA 463.

484 Clinical Internship. (3) SS
Full-time internship under the supervision of practitioners in the Phoenix area or other locales.



College of Business

L. William Seidman, M.B.A., LL.B.
Dean

Purpose

The primary objective of the College of Business is to prepare students for positions of responsibility in the business community. The undergraduate and graduate degree curricula are designed to provide (1) a background of general education helpful to informed, thinking citizens in a democracy, (2) a mastery of basic business tools and skills and an understanding of business procedures, and (3) a specialized and professional knowledge of a selected field of business. To attain these objectives in the undergraduate program, the curriculum has been devised so that the student completes 40 percent of work in general education and other nonbusiness courses and 50 percent in courses offered by the College of Business, with the remaining 10 percent selected from either area by the student in consultation with his/her advisor.

The College is a member of the American Assembly of Collegiate Schools of Business (AACSB), the official accrediting organization in the field of business administration. Both the undergraduate and graduate programs of the College of Business are accredited by this organization.

The College is host to a chapter of Beta Gamma Sigma, a national society that recognizes high academic achievement in AACSB accredited schools. Election to Beta Gamma Sigma is the highest scholastic honor a student in business administration can earn.

In addition to the regular degree curricula, other programs of study in the College are designed to meet special needs. Preparation for the teaching of business, office and distributive education subjects in secondary schools is offered in cooperation with the College of Education. Evening and continuing education courses are conducted for qualified persons who are regularly employed and who otherwise would be unable to enroll in college courses. Short courses and institutes on a noncredit basis are organized in cooperation with various business groups for the furtherance of in-service training of employed personnel.

Organization

The courses of instruction offered by the College of Business are organized into groups in order that a related sequence may be established for the various subject fields.

For administrative purposes, these fields are organized into the following departments: Accounting, Decision and Information Systems, Economics, Finance, General Business, Management, Marketing, and Purchasing, Transportation, Operations.

The Center for Health Services Administration offers a master's degree program designed to prepare qualified individuals who seek careers as administrators of hospitals and other health care organizations.

The Bureau of Business and Economic Research collects, analyzes, and disseminates information on the economy and business climate of Arizona. Forecasts and analysis of Gross State Product, prices, income, employment, real estate activity, and demographic data for Arizona are made available to business and the general public. The Bureau coordinates interdisciplinary sponsored research efforts which will provide useful information to business and a learning experience for students and faculty researchers. The Bureau also provides administrative support and computer consulting for basic and applied faculty research in business and economics.

The Center for Executive Development serves the needs of the community with continuing education programs designed for

business persons and is open to government officials and the general public.

The Center for Private and Public Sector Ethics conducts research and offers educational programs on ethical issues in business, government and the professions. The "Making Ethics Work" series includes seminars for business managers, government managers, and medical and legal professionals. The Center offers programs on specific topics such as ethics for new technologies, ethics and international business, and organizational cultures and ethics. The research of the Center focuses on the role of ethics in the functioning of organizations, on constructive solutions to ethical problems confronting business, and on the advancement of the values of free enterprise. The Center is the sponsor of the Fund for New Technologies and works cooperatively with Centers at the University of Southern California, the University of California at Berkeley, and Stanford University. The Center also conducts the Ethics Roundtable for representatives of leading organizations in the Phoenix Metropolitan area. Contact the Center Director for further information.

The Dean's Council of 100, a group of 100 distinguished business and professional leaders, provides liaison between the College and the business community and develops private support for the priority needs of the College. The Council meets regularly throughout the year with administrators, faculty and students to make recommendations as to how the College can be of greatest assistance in meeting community needs.

Degrees

Bachelor's Degrees. The College of Business awards the Bachelor of Science degree upon successful completion of a four-year curriculum of 126 semester hours as prescribed below. Students may select one of the following 14 majors:

Accounting
Administrative Services
Advertising
Computer Information Systems
Economics
Finance
General Business
Insurance
Management
Marketing
Purchasing/Materials Management
Quantitative Business Analysis
Real Estate
Transportation

Lower division students who wish to qualify to teach business, office and distributive education subjects at the secondary and post-secondary levels should major in pre-secondary education. Upper division students should major in secondary education with a subject matter in business. This curriculum leads to the Bachelor of Arts in Education degree and certification for teaching business, office and distributive education subjects in Arizona schools. Courses to meet university and professional education requirements for this program are listed under the secondary curriculum section of the College of Education. Required business courses may be found on page 169.

Master's Degrees. The Master of Business Administration degree, the Master of Health Services Administration degree, the Master of Accountancy degree, Master of Quantitative Systems degree, and the Master of Science degree in Economics are awarded upon successful completion of programs detailed in the *Graduate College Catalog.*

Master of Business Administration Degree: A general program designed to meet the needs of students who seek broad, integrated graduate course work in the various functional fields of business. The program of study emphasizes the managerial responsibility of policy-formulation, problem-solving and decision-making. Students with undergraduate backgrounds in general education or technical sciences, as well as those with bachelor's degrees in business administration, will find the program well suited to their needs. Students without prior courses in business administration must complete approximately two years of study while those with an undergraduate degree in business administration may complete requirements in one calendar year.

The College of Business and the College of Liberal Arts have defined a program whereby outstanding students may obtain a Bachelor of Arts or Bachelor of Science within the Liberal Arts College and a Master of Business Administration in five years of study. While obtaining the Liberal Arts degree, the capable student will also complete the business prerequisite requirements for the MBA degree.

Master of Health Services Administration Degree: A program designed to prepare

qualified individuals for management careers in hospitals, group practices, health maintenance organizations, long-term-care facilities, and other health services organizations. This preparation is carried out by providing the students selected theories, tools and techniques—the understanding, analysis, and application of which are essential for effective health services administration.

Master of Accountancy: A program designed to provide professional competency in a variety of fields in accounting. In addition to a broadly oriented degree program, the student may choose to specialize in taxation, management advisory services or financial accounting/auditing.

Master of Quantitative Systems: The Master of Quantitative Systems program provides a specialization that stresses the application of decision and information systems to business, economic, governmental, and social issues. It includes substantial familiarization with computer-based systems and quantitative methods to facilitate managerial planning, decision analysis, and control. The program of study consists of a minimum of 30 semester hours with 9 hours in required study and 21 hours in electives to support an area of specialization.

Master of Science Degree in Economics: A specialized program for students who desire to teach in community colleges, to prepare for research positions in business and government, or to take additional graduate work in economics. The master's program in economics requires graduate work in macroeconomic analysis, microeconomic analysis and quantitative methods.

Doctoral Degrees. The Doctor of Philosophy degree (Ph.D.) in Business prepares individuals to teach and conduct scholarly research in a specialized area of concentration in the field of Business Administration, and prepares individuals for positions in business or government where the required educational background is doctoral level study. The Ph.D. degree program requires mathematical competence through linear algebra and calculus, undergraduate or graduate level study in the core areas of business administration and some advanced graduate work in chosen areas of concentration. The program of study includes graduate study in economic analysis, research and teaching methods, and quantitative analysis. The advanced program is comprised of an area of concentration and supporting course work that will best prepare students for conducting scholarly work in their area of interest. The degree is granted upon the completion of an approved program of graduate study, successful completion of comprehensive written and oral examinations, and submission of an acceptable original research project presented in a dissertation.

Doctor of Philosophy Degree in Economics. The degree is awarded upon successful completion of the program as described in the *Graduate College Catalog.* Primary objectives of this degree program are to prepare persons for research positions in public agencies and private business organizations and for teaching and research in institutions of higher learning. The degree is granted upon the completion of an approved program of graduate study, successful completion of comprehensive written and oral examinations, and submission of an acceptable original research project presented in a dissertation.

Curriculum

Bachelor of Science in Business Administration. Students seeking a Bachelor of Science degree in the College of Business must satisfactorily complete a curriculum of 126 semester hours as indicated below:

	Semester Hours
General Studies Requirements	51
Business Core Curriculum	39
Major	24
Electives	12
Total	126

General Studies Requirements. All students in the College of Business are required to complete a total of 51 semester hours in General Studies courses. Courses of a specialized, vocational, technical, or professional nature may not be taken for General Studies credit.

Only certain approved courses from the departmental offerings listed below may be taken to satisfy the requirements in each of these areas. These specific courses are enumerated in *Policy Statement 51* of the College of Business. Students, in consultation with their advisors, *must select all General Studies courses from this list.* Any exceptions must be approved by the Office of Academic Advisement of the College of Business *prior to enrollment in the course.*

Specific courses from the following departmental offerings may be taken to obtain the designated *minimum* number of semester hours required in each of the following areas:

Humanities and Fine Arts .....8 sem. hrs.
Architecture (APH and DES courses only), art (ARH courses only), dance (DAH courses only), English, foreign languages (foreign language literature classes only), humanities, music (MUS courses only), philosophy, religious studies, theatre (THE courses only).

Behavioral and Social Sciences.....15 sem. hrs.
Must include two of these: ASB102, PSG100, and SOC101. Anthropology (ASB), justice studies, cultural geography, economics (ECN 111 and 112 *required*), education, health science, history, home economics, mass communication, political science, psychology (PGS courses only), sociology.

Science and Mathematics.....8 sem. hrs.
Must include a laboratory science. Anthropology (ASM), biology, microbiology, botany, chemistry, engineering, agriculture, astronomy, geology, mathematics (MAT 210 or more advanced course *required*), physical geography, physical science, physics, psychology (PSY courses only), zoology.

Other General Courses
Additional general courses which provide breadth and cultural background must be taken to bring the student's total General Studies credits up to the 51 hour minimum. (See *Policy Statement 51*) All students must complete ENG 101 and 102 (First-Year English), and one of the following communication courses—COM 100, 230, 250—as part of the General Studies requirement.

Total General Studies Courses .....51 sem. hrs.

Business Administration Core Requirements. In order to obtain an understanding of fundamentals of business operation and to develop a broad business background, every student seeking a Bachelor of Science degree in the College of Business must complete the following courses:

ACC	211	Elementary Accounting	3
ACC	212	Elementary Accounting	3
CIS	200	Computers in Business	3
QBA	221	Statistical Analysis	3
QBA	222	Quantitative Information Systems	3
GNB	233	Business Communication	3
GNB	305	Business Law	3
FIN	300	Fundamentals of Finance	3
IBS	300	Principles of International Business	3
OPM	301	Operations and Logistics Management	3
MGT	301	Principles of Management	3
MKT	300	Principles of Marketing	3
MGT	463	Business Policies	3
		Total	39

Major Requirements

A major consists of a pattern of 24 semester hours in related courses falling primarily within a given subject field. Majors are available in accounting, administrative services, advertising, computer information systems, economics, finance, general business administration, insurance, management, marketing, purchasing/materials management, quantitative business analysis, real estate, and transportation.

Accounting. This major includes the essential academic training for: (1) those wishing to prepare for professional careers in public accounting; (2) those seeking positions as controllers, heads of accounting divisions, cost accountants or internal auditors; (3) those wishing to serve in any of the numerous accounting positions offered in federal, state and local governments; and (4) those planning to operate their own businesses.

A major in accounting shall consist of a minimum of 24 semester hours. The following 21 hours must be included:

			Semester Hours
ACC	321	Intermediate Accounting	3
ACC	322	Intermediate Accounting	3
ACC	331	Cost Accounting	3
ACC	351	Income Tax Accounting	3
ACC	383	Advanced Accounting	3
ACC	447	Accounting Information Systems	3
ACC	481	Auditing Theory and Practice	3

To complete the major, the student, with the approval of his advisor, shall select one additional 400-level accounting course.

Administrative Services. The course work in this major area is designed to prepare students for careers in one of the following: office management, small business, paralegal, and business education.

The major in administrative services shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

			Semester Hours
GNB	351	Administrative Office Management	3
GNB	432	Records Management	3

			Semester Hours
GNB	461	Theory of Administrative Communication	3
GNB	431	Business Report Writing	3
CIS	202	Management Information Systems	3

To complete the major, the student, in consultation with his advisor, shall select 9 additional hours of course work from business and economics related to the areas described below.

Office Management. This area of emphasis prepares students for careers in office management, records management, and administrative services.

Small Business Entrepreneurship/Small Business. This area of emphasis prepares students for careers in small business entrepreneurship/Small Business.

Paralegal. This area of emphasis is intended to prepare students for careers as aides to lawyers, trust officers, escrow officers, agents, and brokers in private, governmental and industrial practice.

Business Education. This area of emphasis prepares students who desire to teach business, office, or distributive education subjects in secondary schools.

A student in business education must complete the Business Administration core and ECN 111 and 112. A teaching minor consists of 24 semester hours of credit in business. The remaining courses to complete the major or minor must be selected in consultation with a Business Education advisor.

The Department of General Business participates in programs leading to the degrees of Master of Education, Doctor of Education, and Doctor of Philosophy, Secondary Education. Consult the *Graduate College Catalog* for requirements.

Advertising. Use of the mass communications media for conveying ideas and information to customers, employees, stockholders and the general public is an essential part of modern business operation. This major offers students an opportunity to prepare for careers in advertising, public relations and related activities dealing with mass communications. Employment opportunities include positions with advertising agencies, retail stores, manufacturing firms, newspapers and broadcasting stations.

A major in advertising shall consist of a minimum of 24 semester hours. The following 18 hours must be included:

			Semester Hours
ADV	301	Advertising Principles	3
ADV	311	Advertising Creative Strategy I	3
ADV	371	Advertising Media	3
MKT	351	Marketing Intelligence	3
ADV	452	Strategic Issues in Advertising	3
ADV	461	Advertising Management	3

To complete the major, the student, in consultation with his advisor, shall select 6 hours or more from the following group:

			Semester Hours
ADV	312	Advertising Creative Strategy II	3
MKT	302	Fundamentals of Marketing Management	3
MKT	304	Consumer Behavior	3
MKT	310	Principles of Selling	3
MKT	321	Principles of Retailing	3
MKT	325	Public Relations in Business	3

Computer Information Systems. This major involves the evaluation of internal and external organizational data in order to develop and maintain computerized systems that produce information for planning and control decisions. Special emphasis is placed on the analysis, configuration, programming, and data base aspects of the design and implementation of a computerized business information system. The course work prepares the student for a career in business computer information systems and also enables the student to continue in specialized areas such as systems analysis, business applications programming, business database design, business simulation, and decision support systems.

The major in computer information systems shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

			Semester Hours
CIS	235	Computer Information Systems I	3
CIS	330	Interactive Business Programming	3
CIS	335	Computer Information Systems II	3
CIS	420	Business Database Concepts	3
CIS	440	Systems Analysis and Design	3

To complete the major, the student shall select 9 hours of upper division credit approved in advance by the student's advisor.

Note: All Computer Information Systems majors must complete MAT 242, Elementa-

ry Linear Algebra, and CSC 100, Introduction to Computer Science I. CSC 100 may be counted in the business core in place of CIS 200.

Admission to field: To be admitted to the Computer Information Systems field, a student must have completed the following courses with a minimum grade point average in these courses of 2.50: MAT 210 or higher level; MAT 242; CSC 100; QBA 221; QBA 222.

Economics. The study of economics affords an opportunity for the student to acquire a general knowledge of the methods by which goods and services are allocated, incomes generated, and why prices, employment, money, and financial markets behave as they do. Some knowledge of economics is crucial not only for those intending to participate in the business world, but for those intending to pursue graduate educations in law, or other business fields, or to work in the world of journalism and communication. Economists obtain positions at universities, in government, in financial institutions, brokerage houses, private nonfinancial corporations, in the international organizations, such as IMF and the World Bank, as financial journalists and as marketing and management specialists in domestic and international firms.

The major in economics shall consist of a minimum of 24 semester hours. The following 6 hours must be included:

			Semester Hours
ECN	313	Intermediate Macroeconomic Theory	3
ECN	314	Intermediate Microeconomics Theory	3

To complete the major, the student, with the approval of his advisor, shall select 18 additional hours of course work from among the upper division courses offered by the Department of Economics and from selected courses offered by the College of Business. An internship program is offered for qualified economics majors, normally in the junior or senior year.

Finance. Financial management is the process of planning for, acquiring, and utilizing funds in order to maximize the value of business enterprises. A major in finance prepares students to understand the financial implications inherent in virtually all business decisions. Financial management involves knowledge of the markets which supply funds, development of sound investment criteria, and stimulation of efficient operations. Through proper selection of courses, students can prepare for careers in corporate financial management, management of banking and financial institutions, investments and portfolio management, or financial services.

A major in finance shall consist of a minimum of 24 semester hours. Students planning careers in Corporate Financial Management *must* include:

FIN	331	Financial Markets and Institutions
FIN	421	Investment Analysis
FIN	361	Managerial Finance
FIN	451	Working Capital Management
FIN	461	Financial Management Cases

The remaining 9 hours should be selected from the list of approved courses shown below.

Students planning careers in Banking and Financial Institutions *must* include:

FIN	331	Financial Markets and Institutions
FIN	421	Investment Analysis
FIN	431	Management of Financial Institutions
FIN	436	Bank Financial Management

and two of the following:

FIN	451	Working Capital Management
FIN	427	Speculative Securities
ECN	315	Money and Banking

The remaining 6 hours should be selected from the list of approved courses shown below.

Students planning careers in Investments and Portfolio Management *must* include:

FIN	331	Financial Markets and Institutions
FIN	421	Investment Analysis
FIN	426	Portfolio Analysis
FIN	427	Speculative Securities

and two of the following:

FIN	441	Financial Planning
FIN	461	Financial Management Cases
REA	456	Real Estate Investments

The remaining 6 hours should be selected from the list of approved courses shown below.

Students planning careers in Financial Services *must* include:

FIN	331	Financial Markets and Institutions

FIN 421 Investment Analysis
FIN 426 Portfolio Management
FIN 441 Financial Planning
INS 461 Estate Planning

and one of the following:

INS 321 Life and Health Insurance
ACC 351 Income Tax Accounting

The remaining 6 hours should be selected from the list of approved courses shown below.

To complete the major, all finance students, in consultation with an advisor, shall select from the following:

Finance:	Any advanced finance course open to majors
Insurance:	321, 331, 461, 481
Real Estate:	331, 401, 456
Accounting	321, 322, 331, 351, 383
Economics:	314, 315, 438
Agribusiness:	412

All finance majors are required to take ACC 321, which may be included in the major. Students are urged to take ACC 322, ENG 301 or ENG 312, GNB 431, and an additional public speaking course such as COM 225, COM 325, COM 350, or COM 430.

General Business. Offering the opportunity for a generalist degree in business administration, this major is particularly suitable for (1) those students who are planning to operate their own businesses and who seek a broad business background, (2) those who are preparing for jobs in which specialization is taught after employment, and (3) those who desire a general business background at the undergraduate level prior to taking more specialized graduate work.

The following 12 semester hours must be included in the student's program:

			Semester Hours
ACC	301	Managerial Uses of Accounting	3
FIN	331	Financial Markets and Institutions	3
MKT	302	Fundamentals of Marketing Management	3
ECN	394	Managerial Economics	3

In addition students must select one of the following:

GNB 451 Business Research Methods
MGT 433 Management Decision-Making

The remaining nine hours will be upper-division business courses selected with the counsel of an advisor.

Insurance. Academic preparation for professional work in the insurance industry includes courses in the areas of personal financial planning and business risk management. A major in insurance shall consist of a minimum of 24 semester hours. The following 12 hours must be included:

			Semester Hours
INS	321	Life and Health Insurance	3
INS	331	Property Insurance Principles and Coverage	3
INS	461	Estate Planning	3
INS	481	Risk Management, Theory and Practice	3

To complete the major, the student, in consultation with an advisor, shall select 12 additional hours of approved upper division courses from among those listed in the department advisement guide. Interested students are urged to contact a Finance Department advisor for current information on the insurance major.

Management. The management function includes the planning, organizing, motivating and controlling of business operations. It deals with both human elements and material or physical factors. Through a selection of courses, as outlined below, the student may place major emphasis on human resources management, production and operations management, international management, small business management, or systems management. A major in management shall consist of a minimum of 24 semester hours. The following 15 hours must be included:

			Semester Hours
MGT	311	Personnel Management	3
MGT	352	Human Behavior in Organizations	3
MGT	433	Management Decision Analysis	3
MGT	459	International Management	3
MGT	468	Management Systems	3

The remainder of the required courses shall be selected by the student in consultation with his/her advisor.

Students may select a minimum of 9 hours from one of the following career options:

Human Resources Management:
MGT 413, 422, 423, 452, 494

Production and Operations Management:
OPM 335, 435, 440, 470; PUR 355, 432
International Management:
ECN 331, 336, 361, 371, 488; MKT 435, TRA 463 (Some restrictions apply.)
Small Business Management:
GNB 306, 307, 320, 401, 494 (Some restrictions apply.)
Systems Management:
ACC 301 or 447, CIS 307, ECN 453, OPM 470, MGT 422, 452 (Some restrictions apply.)

Any exceptions to the above options must be approved in advance by the Chair of the Department of Management.

Marketing. Study in the field of marketing involves analysis of the ways business firms plan, organize, administer and control their resources to achieve marketing objectives. Focus is placed on market forces, growth and survival of firms in competitive markets, and the marketing strategy and tactics of the firm. Through proper selection of courses, a student may prepare for a career in (1) general marketing administration, (2) selling and sales management, (3) promotion management, (4) retail merchandising and management, (5) market research and planning, (6) industrial marketing, or (7) international marketing.

A major in marketing shall consist of a minimum of 24 semester hours. The following 12 hours must be included:

			Semester Hours
MKT	302	Fundamentals of Marketing Management	3
MKT	304	Consumer Behavior	3
MKT	351	Marketing Intelligence	3
MKT	460	Strategic Marketing	3

To complete the major, the student, in consultation with his/her advisor, shall select 12 hours from courses offered in marketing and/or advertising, or courses approved in advance by the Department of Marketing.

Purchasing/Materials Management. The major includes the functions of planning, organizing, motivating and controlling the flow of purchased materials, products, and services into and out of the organization. Specific attention is given to planning and scheduling requirements, selecting and analyzing vendors, price determination, purchasing research and value analysis, controlling inventories, materials acquisition, requirements planning, transportation (inbound and outbound), distribution of finished product, and the disposal of scrap and surplus materials.

A major in purchasing/materials management shall consist of the following 24 semester hours:

			Semester Hours
OPM	331	Production and Operations Management	3
PUR	355	Purchasing	3
TRA	345	Traffic Management	3
PUR	432	Materials Management	3
OPM	470	Production Systems	3
TRA	445	Physical Distribution Management	3
PUR	455	Purchasing Research and Negotiation	3
PUR	479	Purchasing and Materials Management Strategy	3

Quantitative Business Analysis. Quantitative business analysis is the process of evaluating both external and internal data to produce decision guidelines for managerial action. Model development and both statistical and mathematical analysis provide the foundations for data evaluation. This major prepares students for professional opportunities in applied business statistics, operations analysis and business planning systems.

The major in quantitative business analysis shall consist of a minimum of 24 semester hours. The following 18 hours must be included:

			Semester Hours
QBA	321	Intermediate Business Statistics	3
QBA	391	Operations Research	3
QBA	405	Sampling Techniques in Business	3
QBA	410	Applied Business Forecasting	3
QBA	421	Advanced Business Statistics	3
QBA	450	Decision Analysis Applications	3

To complete the major, the student shall select 6 hours of upper division courses approved in advance by the student's advisor.

Note: All Quantitative Business Analysis majors must complete MAT 270; MAT 242 or 342; and CSC 100. CSC 100 may be counted in the business core in place of CIS 200.

Admission to major: To be admitted to the Quantitative Business Analysis major, a student must have completed the following courses with a minimum grade point aver-

age in these courses of 2.50: MAT 270; MAT 242 or 342; CSC 100; QBA 221; QBA 222.

Real Estate. Courses in real estate are designed to acquaint students with the basic information, knowledge and practices pertaining to real property and the real estate business. This major is the academic foundation for careers in various aspects of real estate work: sales, acquisition and development, taxation, management of property, title searching and legal work, appraisal and finance.

A major in real estate shall consist of a minimum of 24 semester hours. The following 12 hours must be included:

			Semester Hours
REA	251	Real Estate Principles	3
REA	331	Real Estate Finance	3
REA	401	Real Estate Appraisal	3
REA	411	Real Estate Law	3

To complete the major, the student, in consultation with an advisor, shall select 12 additional hours of upper division courses offered in the College of Business. Students interested in real estate should consult with an advisor in the Finance Department for current program recommendations.

Transportation. The major in transportation covers all modes of transportation of passengers and freight, and the special problems associated with each mode in urban, regional, national and international transportation. Emphasis is on management of transportation organizations, government transportation policy and regulation and deregulation of carriers, and the efficient use of transportation services by business management within the framework of the physical distribution management approach. Students are prepared for employment by carriers, businesses, and government agencies.

A major in transportation shall consist of a minimum of 24 semester hours. The following 12 hours must be included:

			Semester Hours
TRA	301	Principles of Transportation	3
TRA	345	Traffic Management	3
TRA	445	Physical Distribution Management	3
TRA	460	Highway Transportation	3

A student with a major in transportation shall choose 6 hours from the following courses:

			Semester Hours
TRA	405	Urban Transportation	3
TRA	461	Air Transportation	3
TRA	462	Problems in Transportation	3
TRA	463	International Transportation	3

To complete the major, the student, in consultation with the advisor, shall select 6 or more hours from the following:

			Semester Hours
ECN	436	International Trade Theory	3
ECN	451	Economics of Public Utilities	3
PUR	355	Purchasing	3
PUR	432	Materials Management	3
MKT	310	Principles of Selling	3
IBS	300	International Business	3
MKT	435	International Marketing	3
TRA	405	Urban Transportation	3
TRA	461	Air Transportation	3
TRA	462	Problems in Transportation	3
TRA	463	International Transportation	3

Elective Courses. Sufficient elective courses are to be selected by the student to complete the total of 126 semester hours required for graduation.

Honors Program. Students with outstanding academic records may be admitted to the Honors Program by application to the Honors Council of the College of Business. This program provides an opportunity for students with exceptional ability to select an academic program to meet their individual needs. Although the general curriculum requirements must be completed, considerable opportunity is given for independent study under the discretion of an Honors advisor. A thesis or an equivalent creative project is required for graduation.

For further details regarding the Honors Program, see the Academic Advising Office.

Pass-Fail. Students majoring in Business Administration may not include among the credits required for graduation any courses taken at this University on a pass-fail basis.

General Regulations. Each student enrolling in the College of Business will be assigned an advisor upon the basis of the subject matter field in which he/she is primarily interested. The student should follow the sequence of courses suggested in the four-year curriculum outline and the recommendations of the advisor in completing the prescribed background and tool courses in preparation for the subsequent professional program.

The Pre-professional Program. Each student admitted to the College of Business will be designated as a pre-professional business program student. The student will follow the freshman-sophomore sequence of courses listed in the four-year curriculum outline and the recommendations of an academic advisor in completing the prescribed background and tool courses in preparation for the subsequent professional program. Pre-professional program students will not be allowed to register for 300-400 level business courses.

The Professional Program. The third and fourth years constitute the professional program of the undergraduate curriculum.

To make application and be admitted to the professional program, the student must have completed:

1. At least 56 semester hours with a minimum cumulative grade point index of 2.50;
2. All Business Administration core curriculum courses numbered below 300 and ECN 111, 112, and MAT 210 with a minimum cumulative grade point average in these courses of 2.25; and a grade of C or better in each of these courses; and
3. At least 32 semester hours in General Studies, including ECN 111 and 112, and MAT 210; COM 100 or COM 230 or COM 250; a laboratory science class; and two of the following: PGS 100 or SOC 101 or ASB 102.

Failure to meet the requirements for admission to the professional program will result in the student's becoming ineligible to enroll for 300 and 400 level courses in the College of Business.

To be accepted for credit as part of the professional program in Business Administration, all courses transferred from other institutions must carry prerequisites similar to those of the courses they are replacing at Arizona State University.

Non-business Students. Non-business students will be permitted to enroll in upper-division business courses if:

(a) they have junior standing at the time of enrollment, and

(b) they have completed the course prerequisites at the time of enrollment, and

(c) they have a minimum 2.00 cumulative grade point average if the course is *required* as part of their program of study, or

(d) they have a minimum 2.50 cumulative grade point average if the course is *not required* as part of their program of study (e.g., it is a recommended elective but not a required course in the program of study).

Unclassified Undergraduate Students. Unclassified undergraduate students must obtain an override authorization from the College of Business Advising Office. Override authorizations will be issued only to unclassified students who at the time of enrollment have a cumulative grade point average of 2.50 or higher in courses taken at Arizona State University and have completed the course prerequisites or the equivalent.

Probation. All students, freshman through senior, must maintain a minimum GPA for all courses completed at ASU of 2.00 and a minimum GPA for all College of Business courses completed at ASU of 2.00 or be placed on probation. During any semester in which the student is on probation, the student will not be eligible to early register or participate in on-line registration until the probationary period has expired and the student has been restored to good standing.

Disqualification. A student who has not achieved a minimum 2.00 cumulative grade point average in all courses completed at ASU and in all College of Business courses completed at ASU will be disqualified if:

1. During any semester in which the student is on probation the student:
   a. Obtains a semester GPA below 2.50 or
   b. Receives a grade below C in one or more courses or
   c. Fails to complete courses specified by the College as part of his or her individual probationary requirement, or
   d. Withdraws from any College of Business course after the last day to withdraw from a course without academic penalty.

   OR IF

2. At the end of two consecutive semesters on probation the student has not achieved a minimum 2.00 cumulative grade point average in all courses completed at ASU and a minimum 2.00 grade point average in all College of Business courses taken at ASU.

Reinstatement. A student will not be permitted to apply for reinstatement for two semesters after the date of disqualification.

Incomplete. A mark of Incomplete (I) will only be granted in cases where the student can complete the course outside the classroom with the same instructor or an instructor designated by the Department Chair.

Academic Dishonesty. The faculty of the College of Business has adopted a policy on academic dishonesty. A copy of the policy may be obtained in the Academic Advising Office.

Graduation Requirements. In addition to completion of the pattern of courses outlined on pages 168-169, to be eligible for the Bachelor of Science degree in the College of Business a student must fulfill the following requirements:

1. Have completed at least 30 semester hours, including 24 in professional business courses (numbered 300 or above), after admission to the professional program.
2. Have attained a cumulative grade point index of 2.00 or higher;
   (a) for all business courses taken at this University; and
   (b) for all courses comprising his or her field of specialization taken at this University.

A student may, by formal application to the Registrar, request that a grade of D or E in lower division courses not be included in his or her College index after the course has been repeated in residence with a passing grade and prior to completion of the student's first baccalaureate degree.

3. Have earned a minimum of 51 semester hours in traditional courses designed primarily for junior or senior students and completed in an accredited, four-year degree-granting institution.

Any exception to the above requirements must be approved by the Standards Committee of the College of Business.

Application for Graduation. A student must apply for graduation during the semester in which the student will complete 87 semester hours.

Transfer Credit. Students planning to take their first two years of work at a community college or at another four-year college should take only those courses in business and economics that are offered as freshman or sophomore level courses at any of the three state-supported Arizona universities. These lower division courses are numbered 100 through 299 at the three Arizona universities. *A maximum of 30 hours of business and economics courses from community colleges will be accepted toward a bachelor's degree in business administration.*

Professional business courses taught in the junior or senior year in the three State universities may not be completed at a two-year college for transfer credit in the business core or major (field of specialization). The introductory course in business law will be accepted as an exception to this policy, but only lower-division credit will be granted. Such courses may be utilized in the free elective category *subject to the 30-hour limitation.* Courses taught as vocational or career classes at the community colleges which are not taught in the colleges of business at any one of the three State universities will not be accepted for credit toward a bachelor's degree. Courses taught in the upper division business core at the three State universities must be completed at the degree granting institution unless transferred from an accredited four-year school. Normally, upper-division transfer credits will be accepted only from AACSB-accredited schools.

The following general pattern of courses is recommended for students completing their first two years' work in a community college and who plan to transfer to Arizona State University without loss of credit:

Pre-professional Courses ..... 27 Hours
- Accounting 6
- Economics 6
- Statistics and Quantitative Information Systems 6
- Computers in Business 3
- Lower Division Business Electives 6

General Studies ..... 33-37 Hours
- English
- Mathematics
- Science
- Humanities
- Social Sciences

Four-Year Curriculum Outline

FIRST YEAR

	Semester Hours
ENG 101, 102	6
ECN 111, 112	6
MAT 210	3

QBA 221	3
General Studies Requirements	13-15
	31-33

SECOND YEAR

ACC 211, 212	6
QBA 222	3
CIS 200	3
GNB 233	3
COM 100, 230 or 250	3
General Studies Requirements	13-15
	31-33

THIRD YEAR

FIN 300	3
IBS 300	3
MKT 300	3
MGT 301	3
OPM 301	3
GNB 305	3
Field of Specialization, General Studies Requirements, and Electives	14
	33

FOURTH YEAR

MGT 463	3
Field of Specialization, General Studies Requirements, and Electives	28
	31
TOTAL	126

Certificate in International Business Studies. The program of studies leading to the Certificate is designed to prepare students for positions with multinational firms, banks, government agencies and international organizations. This program is not a substitute for the listed areas of business specialization; rather, the courses required for the Certificate add an international dimension to the student's chosen field of specialization.

The requirements for the Certificate are:

1. At least 15 semester hours of approved courses in international business. The objective of this requirement is to introduce the student to the environment and operating principles of international business, to the international aspects of the student's chosen area of specialization, and to the interaction of all the business disciplines in an international environment. IBS 300, Principles of International Business, and ECN 436, International Trade Theory, are required of all candidates for the Certificate. Other international business courses are:

MKT	435	International Marketing
MGT	459	International Management
TRA	463	International Transportation
ECN	331	Comparative Economic Systems
ECN	360	Economic Development
ECN	365	Economics of the Soviet Union and Eastern Europe
ECN	367	Economics of Latin America
ECN	438	International Monetary Economics

2. At least 15 semester hours of approved electives in international and area studies. Six semester hours must be in courses which provide a cross-cultural perspective from the global point of view of one or more disciplines. The remaining 9 semester hours must be in courses which provide an understanding of one region of the world.

3. Evidence of competence in a foreign language equivalent to one year of college study. Since careful planning and selection of courses are necessary to meet the requirements for the Certificate without exceeding the minimum number of hours required for graduation, interested students are urged to consult with a member of the International Business Committee as early as possible.

Asian Studies. Students in the College of Business may pursue a program with emphasis in Asian Studies. As part of the Bachelor of Science degree requirements in Business, at least 30 upper division semester hours of the program must be in Asian Studies content courses (listed on page 57). Reading knowledge of an Asian language is required. The Asian studies content program must be approved by the Center for Asian Studies. (See page 57). Fulfillment of the requirements is recognized on the transcript as a bachelor's degree with a designation of the discipline—Asian Studies. It is possible to complete the certificate program in International Business Studies and the Asian Studies emphasis concurrently.

Latin American Studies. Students in the College of Business may pursue a program with emphasis in Latin American Area Studies. At least 30 upper division semester hours of the program must be in Latin American content courses, including 15 semester hours of Latin American content courses in the College of Business listed above under Certificate in International Business Studies (except ECN 365), and 15 semester hours of Latin American content courses in other disciplines (listed on page 59). A reading knowledge of either Spanish or Portuguese is required. A reading knowledge of both is recommended. The Latin

American content program must be approved by the Center for Latin American Studies (see page 59). Fulfillment of the requirements is recognized on the transcript as a bachelor's degree with a designation of the discipline—Latin American Studies. It is possible to complete the certificate program in International Business Studies and the Latin American emphasis concurrently.

Mexican-American Business Administration Undergraduate Emphasis. The objective of this program is to provide educational opportunities for Mexican-Americans and other interested students who are preparing for leadership positions in local, regional, national and international firms.

The student may enroll in any field of specialization offered by the College of Business. The candidate's degree in Business Administration, combined with directed linguistic and cultural studies, will provide the student with a unique educational experience and a broad background in the liberal arts and in business. Interested students should contact the Academic Advising Office.

Pre-Law Studies. Pre-law students may pursue a program of study in the College of Business. Courses in accounting, economics, finance, insurance, labor relations and statistics are recommended for any student planning to enter the legal profession.

The admission requirements of colleges of law differ considerably. The students should communicate with the dean of the law school they hope to attend and plan a program to meet the requirements of that school. Most law schools, including Arizona State University, require a baccalaureate degree for admission, although some permit admission upon completion of three years of college work.

Students who plan to take a bachelor's degree prior to entering law school may follow any field of specialization in the College of Business. Many pre-law students find it desirable to major in General Business. This gives the student a broad background for the study of law. Within the College of Business are faculty members who are lawyers and who serve as advisors for students desiring a pre-law general business major.

Accounting

PROFESSORS:
SCHULTZ (BA 267A), FLAHERTY, FRITZEMEYER, HARIED, HUIZINGH, IMDIEKE, McKENZIE, RECKERS, R. E. SMITH, TIDWELL, WILKINSON

ASSOCIATE PROFESSORS:
BOYD, JOHNSON, PANY, RENEAU, D. B. SMITH, WYNDELTS

ASSISTANT PROFESSORS:
BALDWIN, CHEWNING, CHRISTIAN, DeBERG, DUNCAN, KAPLAN, KNEER, McKINLEY, O'DELL, PATTISON, SHRIVER

ACC 211 Elementary Accounting. (3) F, S, SS
Theory and practice of accounting applicable to the accumulation, external reporting and external uses of financial accounting information. Prerequisite: At least sophomore standing.

212 Elementary Accounting. (3) F, S, SS
Selection and analysis of accounting information for internal use by management. Prerequisite: ACC 211.

300 Survey of Accounting. (3) N
Financial and managerial accounting emphasizing the uses of accounting information. Not open to students in the College of Business.

301 Management Uses of Accounting. (3) N
Uses of accounting information for managerial decision-making, budgeting, and control. Restricted to nonaccounting majors. Prerequisite: ACC 212.

315 Financial Statement Analysis. (3) N
Analytical methods applied to financial statements for the guidance of management and investors. Designed primarily for nonaccounting majors. Prerequisite: ACC 212.

321 Intermediate Accounting. (3) F, S, SS
Accounting theory and practice applicable to determination of asset values and related problems of income determination. Prerequisite: ACC 212.

322 Intermediate Accounting. (3) F, S
Accounting theory and practice applicable to liabilities and owner's equity. Special problem areas related to income determination and financial reporting. Prerequisite: ACC 321.

331 Cost Accounting. (3) F, S
Cost accumulation systems for product costing; cost behavior concepts for planning and control with the integration of quantitative methods. Prerequisites: ACC 212, QBA 222 and MAT 210 or equivalent.

351 Income Tax Accounting. (3) F, S
Federal income taxation of individuals, partnerships, corporations and fiduciaries. Estate and gift tax. Basic tax planning and research. Prerequisite: ACC 212.

383 Advanced Accounting. (3) F, S
Accounting theory applicable to partnerships, branches, business combinations and nonbusiness organizations. Prerequisite: ACC 322.

432 Advanced Cost Accounting. (3) S
Decision-making, planning and control, including capital budgeting and applications of operations research and statistics. Prerequisite: ACC 331.

447 Accounting Information Systems. (3) F, S
Information requirements and transaction processing procedures relevant to integrated accounting systems, emphasizing systems analysis and design, controls and computer processing. Prerequisite: CIS 200.

452 Advanced Taxation. (3) F, S; Boyd, Duncan, O'Dell
Advanced problems in business and fiduciary income tax, estate and gift tax, planning and research. Prerequisite: ACC 351.

475 Accounting in Public-Sector Organizations. (3) S
Principles of accounting and reporting, budgeting, and financial control systems applied in governmental units and other nonbusiness organizations. Prerequisite: ACC 301 or 331.

481 Auditing Theory and Practice. (3) F, S
Concepts, standards and methods in audit judgment formulation, internal control evaluation, program development and sampling techniques. Ethical and legal considerations. Prerequisite: ACC 322 and ACC 447.

495 Contemporary Accounting Theory. (3) F, S
Theory of financial accounting and reporting requirements for profit oriented enterprises. Prerequisite: ACC 383.

500 Accounting Survey and Analysis. (3) F, S
Basic accounting concepts and procedures for external reporting and internal use by management. Open only to students without previous credit in accounting.

501 Managerial Accounting. (3) F, S
Use of accounting data in the managerial decision-making process and in the analysis and control of business operations. Prerequisite: ACC 500 or equivalent.

511 Tax Planning for Management. (3) F, S
Economic implications of selected management decisions involving application of federal income tax laws. Recognition of tax hazards and tax savings. Prerequisite: ACC 501 or equivalent.

521 Tax Research. (3) F, S
Tax research source materials and techniques. Application to business and investment decisions. Prerequisite: ACC 351.

541 Managerial Accounting Controls. (3) F
Impact of internal reporting systems on organizational decisions and human behavior. Design, implementation, and evaluation problems. Prerequisite: ACC 331 or 501.

551 Advanced Accounting Theory. (3) F
Accounting measurement theories, income determination and financial reporting alternatives.

571 Taxation of Corporations and Shareholders. (3) F, S
Tax aspects of the formation, operation, reorganization, and liquidation of corporations and the impact on shareholders. Prerequisite: ACC 351.

573 Taxation of Partners and Partnerships. (3) F, S
Tax aspects of the definition, formation, operation, liquidation, and termination of a partnership. Tax planning is emphasized. Prerequisite: ACC 351.

575 Estate and Gift Taxation. (3) F, S
Tax treatment of wealth transfers at death and during lifetime, with emphasis on tax planning. Prerequisite: ACC 351.

582 Auditing Theory and Practice. (3) N
Function and responsibility of the auditor in modern society. Advanced topics in auditing theory and methods. Contemporary issues in auditing. Prerequisite: ACC 481.

585 Analytical Methods in Accounting. (3) N
Application of quantitative techniques to accounting problems. Prerequisites: ACC 501 and QBA 501 or equivalents.

586 Problems in Financial Accounting. (3) N
Problems in controversial areas. External reporting requirements for selected industries. Influence of government regulation.

587 Computerized Accounting Systems. (3) S
Design and evaluation of computer-based accounting information system. Development of computer-based financial models for planning and control. Prerequisite: ACC 447.

591 Seminar in Selected Accounting Topics. (3) F, S

791 Doctoral Seminar in Accounting. (3) F, S

Special Courses: ACC 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 35-36.)

Decision and Information Systems

PROFESSORS:
KIRKWOOD (BAC 549), ECK, HERSHAUER, KAZMIER, MAYER, PHILIPPAKIS, WOOD

ASSOCIATE PROFESSORS:
BROOKS, BURDICK, HUSTON, KEIM, O'LEARY, ST. LOUIS, VERDINI

ASSISTANT PROFESSORS:
CARROLL, GODLEWSKI, GREEN, MUTHUSWAMY, PADDOCK, ROY, WILSON

COMPUTER INFORMATION SYSTEMS

CIS 200 Computers in Business. (3) F, S, SS
Uses of computers in processing business data. Introduction to business programming in BASIC. Not open to students with credit in a higher level CIS class. Prerequisites: ACC 212 or concurrent registration, and MAT 210.

202 Management Information Systems. (3) N
Basic computer systems concepts. Introduction to data files, storage, and processing. Uses of COBOL and other suitable languages. Not open to students with credit in a higher level CIS class. Prerequisites: ACC 212 or concurrent registration, and MAT 210.

235 Computer Information Systems I. (3) F, S, SS
Development of computer-generated business reports from business data files. Use of a high-level, file-oriented language. Prerequisites: CSC 100, MAT 242, QBA 221, and either MAT 210 or MAT 270.

307 Systems Modeling. (3) F, S
Procedures for investigating and analyzing decision systems. Use of special languages as tools of analysis and simulation. Prerequisites: CSC 100, QBA 222, and either MAT 210 or MAT 270.

330 Interactive Business Programming. (3) F, S
Development of programs for interactive business data entry, information acquisition and managerial analysis. Programming in an interactive business language. Prerequisites: CIS 235, MAT 242, and either MAT 210 or MAT 270.

335 Computer Information Systems II. (3) F, S
Overview of business software concepts and recent developments. Business applications of the computer via high-level, procedure-oriented languages. Prerequisites: CIS 235, ACC 212, MAT 242, and either MAT 210 or MAT 270.

420 Business Database Concepts. (3) F, S
Overview, applications and management of business database systems and methods. Prerequisites: CIS 335, CIS 330.

430 Advanced Business Programming. (3) N
Applications development and advanced programming concepts. Program structure and design. Software development cycle. Prerequisites: CIS 335, CIS 330.

440 Systems Analysis and Design. (3) F, S, SS
Principles and applications of computer-based management information systems and analysis and design. Prerequisite: CIS 420.

502 Computer Information Systems. (3) A
Electronic data processing systems for administrative applications. Computer hardware, software, programming in business-oriented languages. Prerequisites: MAT 210 and one of the following: CSC 100, CIS 200, or CIS 202.

510 Systems Models and Simulation. (3) A
Design of computer-based decision systems. Simulation as a research and decision-making tool. Prerequisites: MAT 210, QBA 501, and a computational programming language.

515 Management Information Systems. (3) A
Systems theory concepts applied to the collection, retention, and dissemination of information for management decision making. Prerequisite: CIS 502 or equivalent.

520 Systems Design and Evaluation. (3) A
Methodologies of Systems Analysis and Design. Issues include project management, interface, organizational requirements, constraints, documentation, implementation, control and performance evaluation. Prerequisite: CIS 440 or equivalent.

541 Business Database Systems. (3) A
Comparative analysis of hierarchical, network, and relational systems. Theory of information storage and retrieval, and design of effective business information structures. Prerequisites: CIS 420 or equivalent, QBA 501, and MAT 210.

551 Decision Support Systems. (3) A
Definition, description and evaluation of decision support systems; structure and application of selected DSS languages. Prerequisites: CIS 510, QBA 501, and MAT 210.

591 Seminar in Selected Computer Information Topics. (3) A

593 Applied Project. F, S, SS

791 Doctoral Seminar in Computer Information Systems. (3) A

Special Graduate Courses:
See pages 35-36 for special graduate courses which may be offered by this academic unit.

QUANTITATIVE BUSINESS ANALYSIS

QBA 221 Statistical Analysis. (3) F, S, SS
Methods of statistical description. Application of probability theory and statistical inference in business. Prerequisite: MAT 210 or equivalent.

222 Quantitative Business Analysis. (3) F, S, SS
Application of quantitative methods to production, marketing, finance, and management. Use of standard computer programs. Prerequisites: ACC 211 or concurrent registration, MAT 210, and QBA 221.

321 Intermediate Business Statistics. (3) A
Application of regression and analysis of variance models to business and economic problems. Prerequisite: QBA 221 or equivalent.

391 Operations Research. (3) A
Application of quantitative techniques such as mathematical programming and inventory models to business problems. Prerequisites: QBA 222, either MAT 210 or MAT 270, and either MAT 242 or MAT 342.

405 Sampling Techniques in Business. (3) A
Planning, execution and analysis of surveys in business research. Prerequisite: QBA 221 or equivalent.

410 Applied Business Forecasting. (3) A
Application of forecasting techniques in business and institutional environments. Prerequisite: QBA 321.

421 Advanced Business Statistics. (3) A
Applications of probability and statistical inference to business decisions. Probability theory, decision theory and Bayesian inference. Prerequisites: QBA 221, MAT 270.

450 Decision Analysis Applications. (3) A
Implementation of quantitiative techniques for the analysis and solution of managerial problems. Prerequisites: QBA 391, QBA 405, QBA 410.

500 Fundamentals of Business Statistics. (3) F, S, SS
Basic statistical measures. Probability concepts and statistical inference. Prerequisite: MAT 210 or concurrent registration.

501 Managerial Statistics. (3) F, S, SS
Statistical methods used in decision making including analysis of variance, multiple regression, time series, decision theory, and non-parametric statistics. Prerequisites: MAT 210 and QBA 500.

523 Quantitative Models in Decision Making. (3) A
Linear programming, network analysis, inventory models, and simulation for use in decision making. Prerequisites: MAT 210 and QBA 500.

524 Nonparametric Statistics. (3) A
Nonparametric statistical tests for location, dispersion, trend, association, correlation, and goodness-of-fit. Nonmetric scaling techniques. Prerequisites: MAT 210 and QBA 500.

525 Experimental Design. (3) F, S
Analysis of variance and experimental design with emphasis on business research. Multiple regression and correlation. Nonparametric techniques. Prerequisites: MAT 210 and QBA 501.

530 Advanced Experimental Design. (3) A
Advanced statistical methods used in business research. Factorial and repeated measures designs, multivariate analysis of association and interdependence. Prerequisite: QBA 525 or equivalent.

540 Forecasting. (3) A
Foundation of statistical forecasts and forecast intervals; application of classical and computer-assisted forecasting methods to business forecasting problems. Prerequisites: QBA 501 and MAT 210.

550 Decision Analysis. (3) A
Quantitative decision analysis methods for business decision making under uncertainty, including decision diagrams, subjective probabilities, and preference assessment. Prerequisites: QBA 501 and MAT 210.

552 Statistical Decision Theory. (3) A
Statistical decision methods for business decision making under uncertainty, including Bayesian inference, optimal statistical decisions, and value of information assessment. Prerequisites: QBA 501 and MAT 210.

560 Probabilistic Models. (3) A
Development and application of probabilistic models for quantitative business analysis. Prerequisites: QBA 501 and MAT 210.

562 Network Flow Models. (3) A
Introduction to network structure, applications, and algorithms; development of data structures for network

algorithms applied to business problems. Prerequisites: QBA 501, QBA 523, and MAT 210.

564 Nonlinear Optimization. (3) A
Basic properties of solutions and algorithms for constrained and unconstrained minimization, basic descent methods and barrier methods. Prerequisites: QBA 501, MAT 342, and MAT 210.

591 Seminar. (3) A

593 Applied Project. F, S, SS

791 Doctoral Seminar in Quantitative Business Analysis. (3) A

Special Graduate Courses. See pages 35-36 for special graduate courses which may be offered by the academic unit.

Economics

PROFESSORS:
BOYES (BAC 651), BRADA, BURGESS, COCHRAN, FAITH, GOODING, HOGAN, M. JACKSON, KAUFMAN, KINGSTON, KNOX, LADMAN, McPHETERS

ASSOCIATE PROFESSORS:
BLAKEMORE, COX, DeSERPA, HAPPEL, HOFFMAN, LOW, LOWE, McDOWELL, SCHLAGENHAUF, WINKELMAN

ASSISTANT PROFESSORS:
MELVIN, MENDEZ, ORMISTON, J. SMITH, S. SMITH, VILLEGAS

ECN 111 Macroeconomic Principles. (3) F, S, SS
Basic macroeconomic analysis. Economic institutions and factors determining income levels, price levels, and employment levels.

112 Microeconomic Principles. (3) F, S, SS
Basic microeconomic analysis. Theory of exchange and production, including the theory of the firm.

200 Development of the American Economic System. (3) A
Analytical and historical treatment of the growth and development of the American economy, and its institutions from colonial times to the present. Prerequisites: ECN 111, 112.

204 Contemporary Macroeconomic Issues. (3) A
Macroeconomic principles applied to current problems of economic policy, e.g., inflation, unemployment, gross national product (GNP) forecasting. Prerequisite: ECN 111.

205 Contemporary Microeconomic Issues. (3) A
Microeconomic principles applied to current problems of economic policy, e.g., pollution, crime, poverty. Prerequisite: ECN 112.

313 Intermediate Macroeconomic Theory. (3) F, S, SS
Determinants of aggregate levels of employment, output and income of an economy. Prerequisites: ECN 111 and 112.

314 Intermediate Microeconomic Theory. (3) F, S, SS
Role of the price system in organizing economic activity under varying degrees of competition. Prerequisites: ECN 111 and 112.

315 Money and Banking. (3) F, S, SS
Functions of money. Monetary systems, credit functions, banking practices and central banking policy. Prerequisite: ECN 111.

321 Labor Economics. (3) F, S
Origins of labor movement, analysis of labor unions, labor markets, collective bargaining and current policy issues. Prerequisite: ECN 112.

322 Economics of Human Resources. (3) S
Extensions/criticisms of standard labor market theory; current issues in employment/training policy such as education are analyzed. Prerequisites: ECN 111 and 112.

331 Comparative Economic Systems. (3) F, S
Alternative institutions, past and present, for organizing the social division of labor. Property rights, information and incentives in industrial societies. Prerequisite: ECN 111 or 112.

341 Public Finance. (3) F, S
Public goods, externalities, voting models, public expenditures, taxation and budget formation with emphasis on the federal government. Prerequisite: ECN 112.

360 Economic Development. (3) F
Theories of economic growth and development. Role of capital formation, technological innovation, population and resource development in economic growth. Prerequisite: ECN 111 or 112.

365 Economics of the Soviet Union and Eastern Europe. (3) S
Origins and analysis of contemporary institutions. Comparative development and differentiation in the 20th century. Prerequisite: ECN 111.

367 Economics of Latin America. (3) S
Latin American economic development and current issues in the region. Prerequisite: ECN 111 or 112.

404 History of Economic Thought. (3) F
Development of economic doctrines, theories of mercantilism, physiocracy, classicism, neoclassicism, Marxism and contemporary economics. Prerequisites: ECN 111 and 112.

416 Monetary Economics. (3) S
Theoretical and empirical results on the monetary policy process, money demand, and interest rate determination. Prerequisite: ECN 315.

436 International Trade Theory. (3) F, S, SS
The comparative-advantage doctrine, including practices under varying commercial policy approaches. The economic impact of international disequilibrium. Prerequisites: ECN 111 and 112.

438 International Monetary Economics. (3) F, S, SS
History, theory and policy of international monetary economics. Balance of payments and exchange rates. International financial markets including Eurocurrency markets. Prerequisite: ECN 111.

443 Economics of State and Local Government. (3) S
Expenditure and taxation instruments of state and local governments. Local public goods, fiscal federalism, intergovernmental grants, tax limitation, budget determination. Prerequisite: ECN 112.

451 Economics of Public Utilities. (3) A
Economic, legislative and administrative problems in the regulation of public utility rates, costs, plant utilization, service standards and competition. Prerequisite: ECN 112.

453 Government and Business. (3) F, S
Development of public policies toward business. Antitrust activity. Economic effects of government policies. Prerequisite: ECN 112.

473 Urban Economics. (3) F
Models of urban growth and intra-urban location. The demand for and supply of urban public goods and services. Prerequisite: ECN 112.

480 Introduction To Econometrics. (3) S
Elements of regression analysis: estimation, hypothesis tests, prediction. Emphasis is on use of econometric results in assessment of economic theories. Prerequisite: ECN 314.

484 Economics Internship. (3) F, S, SS
Academic credit for professional work organized through the Internship Program.

485 Mathematical Economics. (3) F
Integration of economic analysis and mathematical methods into a comprehensive body of knowledge within contemporary economic theory. Prerequisite: ECN 314 or approval of instructor.

500 Fundamentals of Economic Analysis. (3) F, S, SS
Microeconomic and macroeconomic analysis. Price and output determination in various market structures. Functional distribution of income. Theory of income and employment. Open only to students without previous credit in economics.

501 Managerial Economics. (3) F, S, SS
Application of economic analysis to managerial decision-making in areas of demand, production, cost and pricing. Evaluation of competitive strategies.

504 Development of Economic Analysis. (3) A
Historical development of economic theory. Emphasis on the development of economic analysis from pre-classical economics through Keynes.

507 American Economic Growth. (3) A
Development and growth of the U.S. economy within the framework of economic theory. Institutional change from colonial times to the present.

511 Macroeconomic Analysis I. (3) F
The nation's income, output, employment and general price level. Examination of current theoretical and empirical research and policy problems.

512 Microeconomic Analysis I. (3) F
Theory of exchange, production, resource use and pricing in capitalistic and mixed systems.

513 Macroeconomic Analysis II. (3) S
Advanced topics in macroeconomics. Emphasis on applied macroeconomic models. Prerequisite: ECN 511.

514 Microeconomic Analysis II. (3) S
Advanced topics in microeconomics. Emphasis on general equilibrium, welfare economics, and production and capital theory. Prerequisite: ECN 512.

516 Monetary Theory. (3) F
Traditional and post-Keynesian monetary theory, interest rate determination, the demand and supply of money.

517 Monetary Policy. (3) S
Determinants of the money supply and interest rate levels. Federal Reserve policy and its effectiveness.

521 Labor Economics I. (3) A
Development of basic theoretical models for analyzing labor market issues.

522 Labor Economics II. (3) A
Extensions/criticisms of labor market theories. Applications to a variety of policy issues. Prerequisite: ECN 521.

531 Economic Systems and Organizations. (3) A
Philosophical foundations of major economic systems and of properties of principal system models. Comparison of alternative institutions and system components of contemporary economies.

536 International Economic Theory. (3) A
Theories of comparative advantage and their empirical verification. Theory and political economy of commercial policy. Resource transfers and the role of the MNC.

538 International Monetary Theory and Policy. (3) A
The foreign exchange market, balance of payments, and international financial institutions and arrangements; theory and applications.

543 Public Sector Economics. (3) A
Economics of collective action, public spending, and taxation. Impact of central governmental activity on resource allocation and income distribution.

553 Industrial Organization. (3) A
Analysis of structure, conduct, and performance in industrial markets and recent developments in antitrust policies.

561 Economics of Developing Nations. (3) A
Economic problems, issues and policy decisions facing the lesser developed nations of the world.

572 Regional Economics. (3) A
Introduction to export-base, input-output, linear programming, simulation, and econometric modeling as tools of regional analysis.

573 Urban Economics. (3) A
Models of urban growth and intra-urban location, the urban public sector, and cost-benefit anaysis as a tool of urban analysis.

580 Econometrics I. (3) F
Application of mathematical and statistical techniques to problems of economic theory. Problems in the formulation of econometric models. Prerequisite: 6 hours of statistics.

581 Econometrics II. (3) S
Advanced topics in econometrics. Emphasis on extending the simple linear model and on simultaneous relationships. Prerequisite: ECN 580.

584 Economics Internship. (1-3) SS
Academic credit for professional work organized through the Internship Program.

591 Seminar in Selected Economics Topics. (3) A

791 Doctoral Seminar in Economics. (3) A

Special Courses: ECN 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 35-36.)

Finance

PROFESSORS:
JOEHNK (BA 352), GUNTERMANN, NELSON, POE, STEVENSON, SUSHKA

ASSOCIATE PROFESSORS:
BUTLER, CESTA, DAVIS, HOFFMEISTER, KUDLA, MOREHART, MYLER, OFFICER, WILT

ASSISTANT PROFESSORS:
BOOTH, DERMODY, GALLINGER, IFFLANDER, MARTIN, SMITH, STOLZ

FINANCE

FIN 251 Principles of Personal Investments. (3) F, S, SS
Study of investment concepts and markets used by individual investors, fundamentals of investment techniques, and principles of sound investment manage-

ment. This course may only be used for elective credit in the College of Business.

300 Fundamentals of Finance. (3) F, S, SS
Theory and problems in financial management of firms. *Prerequisites: ACC 212 and ECN 112.*

331 Financial Markets and Institutions. (3) F, S, SS
Analysis of financial markets and intermediaries. Capital market theory, interest rate theory, money and capital market instruments, innovation, and regulation. Prerequisite: FIN 300.

361 Managerial Finance. (3) F, S, SS
Theories and problems in resource allocation, cost of capital, capital budgeting, leverage, dividend, and growth problems. Prerequisite: FIN 300.

421 Investment Analysis. (3) F, S, SS
Security analysis. Risk and return characteristics of stocks, bonds, options, and futures. Overview of security markets. Prerequisite: FIN 300.

426 Portfolio Management. (3) F, S, SS
Theory and management of portfolios to meet investor risk and return objectives. Investment selection and timing techniques. Prerequisite: FIN 421.

427 Speculative Securities. (3) A
Application of financial principles and techniques to contemporary bank problems using case studies and computer simulation. Prerequisite: FIN 421.

431 Management of Financial Institutions. (3) F, S, SS
Asset, liability and capital management in financial institutions. Influence of market factors. Current problems and issues. Prerequisite: FIN 331.

436 Bank Financial Management. (3) F, S, SS
Application of financial principles and techniques to contemporary bank problems using case studies and computer simulation. *Prerequisite: FIN 431.*

441 Financial Planning. (3) F, S
Integrates finance, insurance, real estate, investments, taxation and law into the life-cycle financial planning process. Prerequisite: FIN 300.

451 Working Capital Management. (3) F, S, SS
Analysis of techniques for managing short-term profitability and liquidity. Emphasis on managing cash, accounts receivable, inventory, and current liabilities. Prerequisite: FIN 300.

461 Financial Management Cases. (3) F, S
Case-oriented capstone course in managerial finance, including coverage of working capital management, capital budgeting, capital structure, and financial strategy. Prerequisites: FIN 331, 421, either 361 or 451, ACC 321.

500 Finance Fundamentals. (3) F, S, SS
Theories and problems in financial management of firms; working capital management, capital budgeting, and characteristics of securities issued by corporations. Prerequisites: ACC 500, QBA 500.

501 Managerial Finance. (3) F, S, SS
Current theoretical developments and techniques in financial decision making; including valuation, working capital, financial structure, resource allocation, international. Prerequisite: FIN 500 or equivalent.

521 Security Analysis. (3) F
Valuation techniques for bonds, common stock, preferred stock, warrants, and options; operation and regulation of security markets; introduction to portfolio management. Prerequisite: FIN 500.

526 Portfolio Management. (3) S
Capital market theory and security valuation in a portfolio context. Mathematical approaches to selection of optimal portfolios. Prerequisite: FIN 521.

531 Capital Markets and Institutions. (3) A
Recent theoretical and operational developments in economic sectors affecting capital markets and institutions. Prerequisite: FIN 500.

561 Financial Management. (3) A
Case-oriented course in applications of finance theory to management issues. Acquisition, allocation, and management of funds within the business enterprise. Working capital management, capital budgeting, capital structure, and financial strategy. Prerequisites: FIN 500, ACC 501.

581 Theory of Financial Decisions. (3) F, S
Theories and applications of managerial finance and investments. Capital budgeting, capital structure, dividend theory, and valuation. Prerequisites: ECN 500, FIN 500 and QBA 501.

591 Seminar in Selected Finance Topics. (3) N

791 Doctoral Seminar in Finance. (3)
(a) Investments. F '85, S '87: Investments and market theory; efficient markets hypothesis; option and commodity markets. Prerequisite: FIN 581.
(b) Financial Institutions and Markets. S '86:
Economic and monetary theory applied to financial markets and institutions; implications of financial structure for market performance and efficiency. Prerequisite: FIN 581.

(c) Financial Management. F '86:
Financial theory pertaining to capital structure, dividend policy, valuation, cost of capital, and capital budgeting. Prerequisite: FIN 581.

Special Courses: FIN 484, 492, 493, 494, 497, 498, 499, 584, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 35-36.)

INSURANCE

INS 251 Principles of Insurance. (3) F, S, SS
Coverages available, buying methods, procedures in settling claims, insurance companies, and vocational opportunities.

321 Life and Health Insurance. (3) A
Types of contracts, functions of various contracts, *company organization, rate making, selection of risks* and other home office operations. Governmental supervision of life insurance companies.

331 Property Insurance Principles and Coverage. (3) A
Policies and principles of property and liability insurance. For students planning careers in agency or home office work, or for a fundamental knowledge of insurance for business.

431 Insurance Law. (3) A
Legal concepts and doctrines applicable to the field of insurance. Prerequisite: 6 hours of insurance.

451 Social Insurance. (3) A
Insurance coverages provided by state and federal governments: social security, unemployment insurance, workmen's compensation, and other social or governmental insurance plans.

461 Estate Planning. (3) F, S
Use of life insurance with wills, trusts and business buy-sell agreements. Needs approach to estate planning.

481 Risk Management, Theory and Practice. (3) A
Identification, measurement and treatment of business risk from viewpoint of management. Emphasizes control and/or insuring of commerical risks.

591 Seminar in Selected Insurance Topics (3) N

Special Courses: INS 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 35-36.)

REAL ESTATE

REA 251 Real Estate Principles. (3) F, S, SS
Regulation, practices, legal aspects and professional opportunities of the real estate business.

302 Real Estate Management. (3) F, S
Management of residences, apartments and commercial properties. Consideration of professional standards, methods of business promotion, leasing, insuring and maintaining properties as an agent of the owners. Prerequisite: REA 251.

331 Real Estate Finance. (3) F, S
Determining and developing financial requirements for real estate projects. Prerequisite: REA 251.

401 Real Estate Appraisal. (3) F, S
Factors affecting the value of real estate. Theory and practice of appraising and preparation of the appraisal report. Techniques in appraisals. Prerequisite: REA 251.

402 Income Property Appraisal. (3) F, S
Valuation of net income streams for various types of income producing properties. Prerequisite: REA 401.

411 Real Estate Law. (3) F, S, SS
Legal practices as they apply to the real estate field and to the fields of titles, mortgages, lending and trust work.

441 Real Estate Land Development. (3) F, S
Neighborhood and city growth. Municipal planning and zoning. Development of residential, commercial, industrial, and special purpose properties. Prerequisite: REA 251.

456 Real Estate Investments. (3) F, S
Analysis of investment decisions considering investing property types, market activities, and cash flows. Prerequisite: REA 251.

461 Current Real Estate Problems. (3) A
Recent developments in the fields of real estate, finance, taxation, zoning, planning, governmental regulations and government assistance programs. Prerequisite: REA 251.

591 Seminar in Selected Real Estate Topics. (3) N

Special Courses: REA 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 35-36.)

General Business

PROFESSORS:
BOGGS (BA 319), BATY, GRYDER, HENNINGTON, JENNINGS

ASSOCIATE PROFESSORS:
ARANDA, BOHLMAN, CHILDERS, DUNDAS, GILSDORF, GOLEN, HUTT, LEONARD, LYNCH, MURRANKA, OLIVAS, OLNEY, RADER, SMITH, VAN HOOK, WILSON, WUNSCH

ASSISTANT PROFESSORS:
DONOVAN, ESQUER, HURSTON, KELLER, LEWIS, LOCK, REISS

GENERAL BUSINESS

GNB 101 Elements of Business Enterprise. (3) F, S, SS
Business enterprise as an integral part of American society. Emphasis on social, functional, political, legal, and ethical considerations. Not open to students who have received credit in ECN 112 and MGT 301.

233 Business Communication. (3) F, S, SS
Written and oral business reporting. Organization, analysis, and presentation of business information, using various formats and media. Prerequisite: ENG 102.

305 Legal Environment of Business. (3) F, S, SS
Legal framework governing rules of conduct among businesses and the impact on establishing business policy.

306 Business Law. (3) F, S, SS
Legal aspects of contracts, sales, commercial paper, secured transactions, documents of title, letters of credit, and bank deposits and collections.

307 Business law. (3) F, S
Legal aspects of agency, partnerships, corporations, regulation of businesses, bankruptcy and property.

320 Entrepreneurship. (3) F, S
Opportunities, risks and problems associated with small business development and operation.

344 Administrative Services. (3) F, S
Integrating information processing technology for the automated office.

351 Administrative Office Management. (3) F, S
Relationship of administrative office management to the business enterprise.

401 Small Business Administration. (3) F, S, SS
Students, acting as management consultants, apply business principles and make recommendations to small businesses while learning to manage small firms. Prerequisite: Business core except MGT 463.

420 Entrepreneurship: Venture Design and Development. (3) F, S
Analysis, design and development of a business plan for a new venture. Prerequisite: ACC 212.

431 Business Report Writing. (3) F, S, SS
Organization and preparation of reports used in business. Prequisite: ADS 233.

432 Records Management. (3) F, S
Organization and management of manual and automated records systems.

451 Business Research Methods. (3) A
Nature and purpose of research. Prerequisite: QBA 222.

461 Theory of Administrative Communication. (3) F, S, SS
Intrapersonal, interpersonal and administrative communication.

500 Legal Environment of Business. (3) F, S, SS
Public and private aspects of the legal environment of business and contemporary legal problems. Not open to those who have received credit in ADS 305 or equivalent.

501 Business Research Methods. (3) F, S, SS
Selection, design, and completion of a business oriented research project.

591 Seminar: Professional Report Writing. (3) F, S

591 Seminar in Selected Office Administration Topics. (3) N
Prerequisite: ECN 111 or 112.

700 Research Methods. (3) A

Special Courses: GNB 394, 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 593, 594, 598, 599, 690, 692, 700, 790, 791, 792, 799. (See pages 35-36).

BUSINESS EDUCATION

BUE 401 Vocational Education in American Schools. (3) N
Basic principles and philosophies of vocational education.

480 Teaching Business, Office and Distributive Education Subjects. (4) S
Organization and presentation of appropriate content for these subject areas in the secondary school.

491 Organization and Management of Cooperative Programs. (3) A
Work-study programs for business occupations in high schools and community colleges.

501 Foundations of Business Education. (3) A
History, philosophy, principles and objectives of business education.

503 Tests and Measurements in Business Education. (3) A
Construction, administration and evaluation of tests in business subjects.

505 Current Literature in Business Education. (3) A
Critical analyses, generalizations, and trends.

506 Data Processing for Teachers. (3) A
Development of curriculum, lesson plans, and strategies for teaching information processing; hardware/software evaluations and equipment acquisition techniques.

511 Improving Instruction in Secretarial Subjects. (3) A
Modern methodology in teaching typewriting, shorthand and office education courses.

513 Improving Instruction in Accounting and Basic Business Subjects. (3) A
Modern methodology in teaching accounting and basic business courses.

515 Observation and Work Experience. (3) A
Observation and/or participation in business.

591 Seminar. (3) A
Topics such as the following will be offered:

(a) Guidance for Business Education
(b) Analysis of Research in Business Education
(c) Administration and Supervision in Business Education
(d) Individualized Progression
(e) Consumer Education
(f) Information Processing

594 Study Conference or Workshop. (3) A

791 Doctoral Seminar in Business Education. (3) A

Special Courses: BUE 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 594, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 35-36.)

Health Services Administration

PROFESSOR:
BOISSONEAU

ASSOCIATE PROFESSOR:
WILLIAMS

ASSISTANT PROFESSOR:
KIRKMAN-LIFF

HSA 501 Health Care Organization. (3) F, S
Concepts, structures, functions and values which characterize contemporary health care systems in the United States.

504 Community Health Care Perspectives. (3) S
Epidemiological, sociological and political perspectives and techniques for analyzing health problems and responding to health care needs in communities. Prerequisite: HSA 501.

520 Hospital Structure and Policy. (3) S
Functional relationships among managerial elements of health care institutions with major focus on hospital governance and policy dynamics. Prerequisite: HSA 501.

522 Hospital Administrative Practices. (3) F
Systems concepts, quantitative methods and information systems applied to management problems in health institutions and community health planning. Prerequisites: HSA 501 and 520, QBA 522.

532 Financial Management of Health Services. (3) F
Acquisition, allocation and management of financial resources within the health care enterprise. Budgeting, cost analysis, financial planning and internal controls. Prerequisites: HSA 501 and 520.

542 Health Care Jurisprudence. (3) F
Legal aspects of health care delivery for hospital and health services administration. Legal responsibilities of the hospital administrator and staff. Prerequisites: HSA 501, 504, 520.

591 Integrative Seminar. (3) F
Capstone assessment of current policies, problems and controversies across the broad spectrum of health services administration. Prerequisites: HSA 501, 504, 520.

In addition, seminar topics such as the following may be offered:

(a) Comparative health care systems
(b) Ambulatory care administration
(c) Health care marketing
(d) Strategic planning
(e) Health economics

593 Applied Project. (3) F, S, SS
Supervised on-site experience in advanced development of managerial skills in health services administration and policy. Prerequisites: All courses in approved MHSA program of study.

Special Graduate Courses: HSA 590, 592, 598, 599. (See pages 35-36.)

International Business Studies

IBS 300 Principles of International Business. (3) F, S, SS
Multidisciplinary analysis of international economic and financial environment. Operations of multi-national firms and their interaction with home and host societies. Prerequisite: ECN 112.

591 Seminar in International Business. (3) N
Descriptions of the following courses can be found in the appropriate departmental listing:

ACC	591	Seminar in Multinational Tax
ECN	331	Comparative Economic Systems
ECN	360	Economic Development
ECN	365	Economics of the Soviet Union and Eastern Europe
ECN	367	Economics of Latin America
ECN	436	International Trade Theory
ECN	438	International Monetary Economics
ECN	531	Economic Systems and Organizations
ECN	536	International Economic Theory
ECN	538	International Montetary Theory and Policy
ECN	561	Economics of Developing Nations
MGT	459	International Management
MGT	559	International Comparative Management
MKT	435	International Marketing
MKT	591	Seminar: Marketing in International Operations
TRA	463	International Transportation

Management

PROFESSORS:
_____ (BA 367E), GROSSMAN, KREITNER, PASTIN, REIF, SCHABACKER, WERTHER, WHITE

ASSOCIATE PROFESSORS:
BASSFORD, BOHLANDER, BRENENSTUHL, COOK, HOM, MENDLESON, MONTANARI, MOORHEAD, SHIPPER

ASSISTANT PROFESSORS:
BRACKER, KEATS, KINICKI

MGT 301 Management and Organization Behavior. (3) F, S, SS
Administrative, organizational, and behavioral theories and functions of management contributing to the effective and efficient accomplishment of organizational objectives. Prerequisites: two approved courses in Psychology or Sociology.

311 Personnel Management. (3) F, S, SS
Manpower planning, staffing, training and development, compensation, appraisal and labor relations. Prerequisite: MGT 301.

352 Human Behavior in Organizations. (3) F, S, SS
Human aspects of business as distinguished from economic and technical aspects and how they influence efficiency, morale and management practice. Prerequisite: MGT 301.

413 Wage and Salary Management. (3) F, S
Installation and administration of a complete wage and salary program. Includes objectives, policies, organization, control, job evaluation, and wage surveys. Prerequisite: MGT 311.

422 Training and Development. (3) F, S
Learning theory, orientation and basic level training, management development, resource materials and methods. Prerequisite: MGT 311.

423 Industrial Relations and Collective Bargaining. (3) F, S
Processes and procedures of collective bargaining. Scope and negotiation of union contracts.

433 Management Decision-Analysis. (3) A
Decision-making concepts and methods in the private and public sectors, and their application to organizational problems. Understanding of individual and group decision making. Prerequisite: MGT 301.

434 Social Responsibility of Management. (3) F, S, SS
Relationship of business to the social system and its environment. Criteria for appraising management decisions. Managers as change agents. Prerequisite: MGT 301.

452 Organizational Behavior Applications. (3) F
The complex set of behavioral forces and relationships that influence organizational effectiveness. Intervention strategies and application skills. Prerequisite: MGT 352.

459 International Management. (3) F, S
Concepts and practices of multinational and foreign firms. Objectives, strategies, policies and organizational structures for operating in various environments. Prerequisite: MGT 301.

463 Business Policies. (3) F, S, SS
Policy formulation and administration of the total organization, including integrative analysis and strategic planning. Prerequisite: Completion of 87 hours, including all other Business Administration core requirements. Recommended for *last* semester of senior year.

468 Management Systems. (3) A
Systems theory and practice applied to organization process and research. Organizations seen as open systems interacting with changing environments. Prerequisite; MGT 301.

500 Fundamentals of Management. (3) F, S, SS
Managerial functions. Performance models. Environmental constraints. Operations and personnel functions. Not open to students who have earned credit in MGT 301 or equivalent.

501 Managerial Concepts. (3) F, S, SS
Analysis of current administrative philosophy and practice and their evolution. Integration of an organization from the viewpoint of an administrator. Prerequisite: MGT 301 or 500.

503 Organizational Behavior. (3) F, S, SS
Development of effective work groups. Analysis of cases in organizational relationships. Group dynamics; effects of change and informal organization.

520 Problems in Personnel Management. (3) S, SS
Selecting, developing, maintaining and utilizing a competent labor force. Case studies of personnel problems. Preparation of a written personnel program.

522 Labor Relations and Public Policy. (3) F
State and federal legislation. Recent decisions of courts and labor boards. Legal rights and duties of employers, unions and public.

559 International Comparative Management. (3) S
Analysis of comparative management practices, problems, and issues. Management strategies for the multinational organization. Impact of national and cultural environments.

589 Business Strategy and Policy. (3) F, S, SS
Formulation of strategy and policy in the organization, emphasizing the integration of decisions in the functional areas. Prerequisites: ACC 501, ECN 501, FIN 561, MGT 501, MKT 501, and QBA 501.

591 Seminar. (3) F, S, SS
Topics such as the following will be offered:
(a) Managerial Planning and Control
(b) Business and Society
(c) Research and Development Management
(d) History of Management Thought
(e) Comparative Administration

791 Doctoral Seminar in Management. (3) F, S

Special Courses: MGT 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 792, 799. (See pages 35-36.)

Marketing

PROFESSORS:
WALKER (BAC 471), BROWN, GWINNER, D. JACKSON, OSTROM, OVERMAN, ROWE, SCHLACTER

ASSOCIATE PROFESSORS:
CROSBY, GOURLEY, HUTT, MOKWA, REINGEN

ASSISTANT PROFESSORS:
BELTRAMINI, BLASKO, CROSS, EVANS, GAIDIS, GILL, KALE, STEPHENS, SWARTZ

ADVERTISING

ADV 301 Advertising Principles. (3) F, S, SS
Advertising as a communications tool in marketing and business management. Survey of market segmentation, creative strategy, media, and effectiveness measures. Not open to students with credit in MKT 412. Prerequisite: MKT 300.

311 Advertising Creative Strategy I. (3) F, S
Application of communication theory to advertising. Identification of agency approaches to the creative discipline. Evaluation of advertising strategies and executions. Prerequisite: ADV 301; non-business majors must obtain departmental approval.

312 Advertising Creative Strategy II. (3) A
Development and expansion of creative strategies into print and broadcast advertising messages. Evaluation of the creative component of advertising campaigns. Prerequisite: ADV 311.

371 Advertising Media. (3) F, S
Media strategy as an extension of marketing strategy; conceptual aspects of media planning; quantitative and qualitative analysis of media. Prerequisite: ADV 301; non-business majors must obtain departmental approval.

452 Strategic Issues in Advertising. (3) F, S
Contemporary theoretical and research considerations in advertising strategy development, focusing on positioning, concept and copy testing, media, and budgeting. Prerequisites: ADV 311, ADV 371, and MKT 351.

461 Advertising Management. (3) F, S
A capstone course in advertising dealing with the management of advertising from both the client and agency perspectives. Prerequisites: ADV 311 and ADV 371.

591 Special Topics in Advertising. (3) N

Special Courses: ADV 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 35-36.)

MARKETING

MKT 300 Principles of Marketing. (3) F, S, SS
Role and process of marketing within the society, economy, and business organization. Prerequisite: ECN 112.

302 Fundamentals of Marketing Management. (3) F, S, SS
Marketing planning, implementation, and control by organizations, with special emphasis on identifying market opportunities and developing marketing programs. Prerequisite: MKT 300.

304 Consumer Behavior. (3) F, S, SS
Application of behavioral concepts in the analysis of consumer behavior and the use of behavioral analysis in marketing strategy formulation. Prerequisite: MKT 300.

310 Principles of Selling. (3) F, S
Basic principles underlying the selling process and their practical application in the sale of industrial goods, consumer goods and intangibles. Prerequisite: MKT 300.

321 Principles of Retailing. (3) F, S
Role of retailing in marketing. Merchandising (buying and selling), location, promotion, organization, personnel and control in a retail enterprise. Prerequisite: MKT 300.

325 Public Relations in Business. (3) F, S
Role of public relations in business, government and social institutions, emphasizing policy formulation from a managerial perspective. Prerequisite: MKT 300.

351 Marketing Intelligence. (3) F, S
Integrated treatment of the traditional approaches to marketing research and analysis of environmental factors affecting marketing decisions in the firm. Prerequisite: MKT 300 and QBA 221.

411 Sales Management. (3) A
Application of management concepts to the administration of the sales operation. Prerequisite: MKT 302.

412 Marketing Communications. (3) F, S
The communication process as it relates to the promotional activities of the firm from a strategic point of view. Prerequisite: MKT 302.

424 Retailing Management. (3) A
Problems of retailing management including functions within various institutions and retailing of goods and services. Prerequisite: MKT 321.

434 Industrial Marketing. (3) A
Strategies for marketing products and services to industrial, commercial and governmental markets. Changing industry and market structures. Prerequisite: MKT 302.

435 International Marketing. (3) F, S
Analysis of marketing strategies developed by international firms to enter foreign markets and to adapt to changing international environments. Prerequisite: MKT 302.

444 Marketing Channels. (3) A
Distribution channels used by firms engaged in marketing and manufacturing. Strategies for marketing-channels management. Relationships among marketing intermediaries. Prerequisite: MKT 302.

460 Strategic Marketing. (3) F, S, SS
Policy formulation and decision making by the marketing executive. Integration of marketing programs and consideration of contemporary marketing issues. Prerequisite: MKT 302, MKT 304, and MKT 351.

500 Fundamentals of Marketing. (3) F, S
An introduction to marketing concepts and functions utilized by organizations to achieve their goals within dynamic external environments. Not open to students who have earned credit in MKT 300.

501 Marketing Management. (3) F, S, SS
Development and implementation of marketing objectives and strategies in response to market opportunities, environmental change, and competition. Prerequisite: MKT 500 or 300.

502 Public Relations. (3) N
Modern public relations concepts applied to managerial decision making. Includes historical cases and current problems.

520 Strategic Perspectives of Buyer Behavior. (3) A
Concepts and theories from the behavioral sciences as they relate to marketing strategy formulation. Prerequisite: MKT 500 or equivalent, or approval of instructor.

522 Marketing Information. (3) A
Marketing research, marketing information systems and modern statistical techniques in marketing decision-making. Prerequisite: MKT 501.

563 Marketing Strategy. (3) F, S
Planning and control concepts and methods for developing and evaluating strategic policy from a marketing perspective. Prerequisite: MKT 501.

591 Seminar. (3) N
Topics such as the following will be offered:

(a) Product Strategy
(b) Channel Strategy
(c) Promotion Strategy
(d) Marketing in International Operations
(e) Marketing Strategy in Not-for-Profit and Public Sector Organization

791 Doctoral Seminar in Marketing. (3) F, S

Special Courses: MKT 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 35-36.)

Purchasing, Transportation, Operations

PROFESSORS:
FEARON (323-E), BRITNEY, FARRIS, FAY, HENDRICK, REUTER, RIDER, RUCH, SHROCK, VELLENGA

ASSOCIATE PROFESSORS:
CALLARMAN, DANIEL

ASSISTANT PROFESSORS:
PEARSON, RECK

OPERATIONS/PRODUCTION MANAGEMENT

OPM 301 Operations and Logistics Management. (3) F, S, SS
Identification and integration of major components of operations and logistics management, and their impact on organizational productivity and performance.

331 Production and Operations Management. (3) F, S, SS
Use of resources in producing goods and services. Concepts of planning, scheduling and controlling productive activities and physical resources.

335 Methods Management. (3) F, S
Theory and practice in work design, methods improvement and work measurement. Relationship of attitudes and productivity.

435 Service Operations Management. (3) F, S
Operations management techniques used in manufacturing and their application in service organizations. Prerequisite: OPM 331 or by approval of instructor.

440 Productivity and Quality Management. (3) F, S
Productivity concepts at the national, organizational, and individual levels. Quality management and its relationship to productivity in all organizations. Prerequisite: OPM 331 or by approval of instructor.

470 Production Systems. (3) F, S, SS
Systems theory and management functions; basic tools of systems analysis; organizational systems design; systems applications; systems simulation. Prerequisite: MGT 301.

475 Operations Strategies. (3) S
Integrates operations management into strategic planning, implementation, and control. Prerequisites: OPM 331, PUR 432, OPM 435, and OPM 440.

581 Management of Production. (3) S, SS
Analysis of the production function from a managerial point of view. Conceptual foundations, analysis of major problems and decision processes.

591 Seminar. (3)
Topics such as the following will be offered:

(a) Production Systems Research
(b) High-Tech Operations

Special Courses: See pages 35-36 for special graduate courses which may be offered by this academic unit.

PURCHASING/MATERIALS MANAGEMENT

PUR 355 Purchasing. (3) F, S
Management of the purchasing function, including organization, procedures, supplier selection, quality, inventory decisions, and price determination.

432 Materials Management. (3) F, S
Analysis and managerial integration of the material flow process within an organization, including purchasing, production and inventory control, and MRP. Prerequisite: OPM 331.

455 Purchasing Research and Negotiation. (3) F, S
Current philosophy, methods, and techniques used to conduct both strategic and operations purchasing research and negotiation. Includes negotiation simulations. Prerequisites: OPM 331, PUR 355.

479 Purchasing and Materials Management Strategy. (3) F, S
Synthesis of purchasing, production, transportation to provide a systems perspective of materials management. Development of strategies. Prerequisites: OPM 331, 470; PUR 355, 432, 455; TRA 345.

532 Materials and Purchasing Management. (3) F
Analysis of the incoming flow of materials and the economic environment in which the materials acquisition and allocation functions operate.

591 Seminar. (3)
Topics such as the following will be offered:

(a) Contracting

(b) Systems Acquisitions

(c) Purchasing Research

Special Courses: See pages 35-36 for special graduate courses which may be offered by this academic unit.

TRANSPORTATION

TRA 301 Principles of Transportation. (3) F, S, SS
Economic characteristics, regulation, and public policy implications of rail, motor, air, water and pipeline transportation. Managing the shipper's transportation needs.

345 Traffic Management. (3) F, S
Traffic management in business enterprises: analysis of shipper-carrier relationships and the legal environment with respect to rates and services. Prerequisite: ECN 202.

405 Urban Transportation. (3) F, S
Economic, social, political and business aspects of passenger transportation. Public policy and government aid to urban transportation development.

445 Physical Distribution Management. (3) F, S
Managing the firm's physical distribution activities; integrating transportation, inventory, warehousing, facility location, customer service, and related activites in system context. Prerequisites: TRA 301 or TRA 345.

460 Highway Transportation. (3) F, S
Analysis of motor carrier economics, regulation, management and rate making practice; evaluation of public policy issues related to highway transportation. Prerequisite: TRA 301.

461 Air Transportation. (3) F, S, SS
Economic and legal environment of air transportation; government policies concerning promotion, financing, and economic and safety regulation; carrier operating practices. Prerequisite: TRA 301.

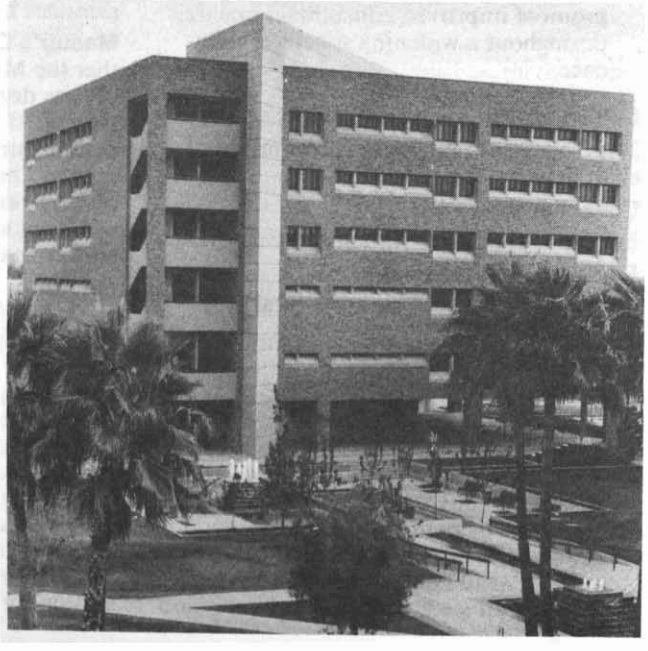
462 Problems in Transportation. (3) S
Current problems of transportation operation, physical distribution and logistics, carrier management, and public transportation policy. Prerequisite: TRA 301.

463 International Transportation. (3) F, S
Role of transportation in international business; economic and legal environment; carrier operations and practices; managing the firm's international transportation needs.

541 National Transportation Policy. (3) F
Policy alternatives and problems in transportation; interrelationships of competing transportation modes; relationships of public investment to private operations.

545 Business Logistics. (3) S
Systems management concepts approach to logistics requirements of the business enterprise; analysis of goods and information flows and coordinating activities.

Special Courses: See pages 35-36 for special graduate courses which may be offered by this academic unit.



College of Education

Purpose

The central purposes of the College of Education are to prepare leaders in education and to help improve the quality of education in the United States.

Supportive purposes are:

1. To contribute to the body of professional knowledge in the field of education through research, the development of educational theory, and innovation and experimentation in educational method and organization.
2. To offer leadership beyond the campus through the dissemination of information and ideas and through cooperative involvement with other agencies engaged in education.
3. To provide services to other agencies engaged in education in such manner as to promote improved educational practice throughout a widening sphere of influence.

Organization

The College of Education is comprised of eight departments. They are:

Counselor Education

Educational Administration and Supervision

Educational Psychology

Educational Technology and Library Science

Elementary Education

Higher and Adult Education

Secondary Education

Special Education

Several bureaus, centers and special laboratories directly complement the academic programs of the College. These include the Arizona Educational Information System; Center for Adolescent Research, Evaluation and Service; Center for Bilingual/Bicultural Education; Center for Indian Education; Center for Multicultural Education; Counselor Training Center; Instructional Resources Laboratory; Office of Field Services; Office of Research Services; Office of Student Services; I.D. Payne Laboratory for Multicultural Education; Professional Field Experiences; Psychological Assessment Laboratory; Reading Center/Clinic; Southwest Regional Center for Community Education Development; Special Education Testing Clinic; and University Testing Services.

Degrees

Bachelor of Arts in Education Degree. Several undergraduate majors are available leading to the degree Bachelor of Arts in Education, which requires a minimum of 126 semester hours of credit.

Master's Degree. Students may enroll in either the Master of Education or the Master of Arts degree program. Each program consists of 30-42 semester hours of study, depending upon given departmental requirements. The Master of Arts programs emphasize research competencies. The Master of Education programs stress development and extension of professional competence.

Master of Counseling Degree. A first-level professional degree, Master of Counseling, is awarded upon the satisfactory completion of a two-year (60 semester hours) program of approved graduate studies. This program provides for a core of required professional studies supported by related disciplines, and for two professional specialization options. The Practitioner Option provides thorough professional preparation for counseling in a variety of school and community settings. The Research Option is well suited as preparation for future doctoral study. With

teacher certification, either option prepares the student for school counselor certification in Arizona and other states. For further information regarding admission and courses of study, contact the Department of Counselor Education.

Education Specialist Degree. The degree Education Specialist is awarded for satisfactory completion of the Specialist program of graduate studies.

Doctor of Education Degree. The degree Doctor of Education is awarded for satisfactory completion of this doctoral program of graduate studies.

Doctor of Philosophy Degree. The degree Doctor of Philosophy is awarded for satisfactory completion of this doctoral program of graduate studies.

Admission to Undergraduate Programs

Students wishing to enroll in the College of Education should declare their intent during their freshman or sophomore year and register for advisement with the College of Education, Office of Student Services. Advisors will assist students to meet all requirements for admission to and completion of the Professional Preparation Sequence.

Admission to the Professional Preparation Sequence requires:

1. Completion of at least 56 semester hours of appropriate University course work with a cumulative grade point average of 2.50 or higher;
2. Approval by the Office of Student Services certifying that the student has met all requirements, including successful passage of required personal and academic tests or examinations;
3. Satisfactory completion of Semester I of The Teacher Education Program.

Selected Studies in Education. Students who wish to major in education but choose careers in fields other than public school teaching can elect to develop an individualized degree program. Such students should seek advice early from the College of Education Office of Student Services and declare their intent prior to second semester of the junior year. A student is considered admitted when the program is accepted by the Program Standards Committee.

Admission of Transfer Students. Students planning to study education and who transfer to Arizona State University from other universities or colleges should seek advice early from the College of Education Office of Student Services.

Retention and Disqualification

1. A student must maintain a cumulative grade point average of 2.50 or better to remain in good standing. Any student whose cumulative grade average is below the required index may be placed on academic probation. Once a student is on academic probation, he/she remains in that status until the grade point index reaches the retention level, 2.50, or he/she is disqualified from the University. Unless the Program Standards Committee acts otherwise, a student with a deficient grade point index may not enroll in any of the Professional Education classes.
2. A student must also maintain sound physical and mental health. A student who appears to lack the degree of physical and mental health necessary to function successfully as a teacher may be required to take a medical examination and make the results available to the Program Standards Committee of the College of Education. The responsibility for reviewing and determining the qualification of students whose behavior and/or performance are in question is vested in the Program Standards Committee. The Committee's decision may require the dismissal or disqualification of a student from the College.
3. Any student who has earned the number of semester hours required for graduation, but has not achieved the 2.50 index required for graduation, is subject to disqualification.
4. A disqualified student who desires to be reinstated may submit an application for reinstatement. A disqualified student normally will not be reinstated until at least one semester has elapsed from the date of disqualification. The burden of establishing fitness is on the disqualified student, who may be required to take aptitude tests and submit to other examinations before being readmitted.
5. While students are subject to the general retention policies of the University, they are evaluated in the College on broader criteria than mere academic average. Students are reviewed for evidence of competency for teaching and are continuously evaluated as they progress in the program. Prospective teacher candidates

College of Education

Purpose

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Admission to Undergraduate Programs

Students wishing to enroll in the College of Education should declare their intent during their freshman or sophomore year and register for advisement with the College of Education, Office of Student Services. Advisors will assist students to meet all requirements for admission to and completion of the Professional Preparation Sequence.

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2. Approval by the Office of Student Services certifying that the student has met all requirements, including successful passage of required personal and academic tests or examinations;
3. Satisfactory completion of Semester I of The Teacher Education Program.

Selected Studies in Education. Students who wish to major in education but choose careers in fields other than public school teaching can elect to develop an individualized degree program. Such students should seek advice early from the College of Education Office of Student Services and declare their intent prior to second semester of the junior year. A student is considered admitted when the program is accepted by the Program Standards Committee.

Admission of Transfer Students. Students planning to study education and who transfer to Arizona State University from other universities or colleges should seek advice early from the College of Education Office of Student Services.

Retention and Disqualification

1. A student must maintain a cumulative grade point average of 2.50 or better to remain in good standing. Any student whose cumulative grade average is below the required index may be placed on academic probation. Once a student is on academic probation, he/she remains in that status until the grade point index reaches the retention level, 2.50, or he/she is disqualified from the University. Unless the Program Standards Committee acts otherwise, a student with a deficient grade point index may not enroll in any of the Professional Education classes.
2. A student must also maintain sound physical and mental health. A student who appears to lack the degree of physical and mental health necessary to function successfully as a teacher may be required to take a medical examination and make the results available to the Program Standards Committee of the College of Education. The responsibility for reviewing and determining the qualification of students whose behavior and/or performance are in question is vested in the Program Standards Committee. The Committee's decision may require the dismissal or disqualification of a student from the College.
3. Any student who has earned the number of semester hours required for graduation, but has not achieved the 2.50 index required for graduation, is subject to disqualification.
4. A disqualified student who desires to be reinstated may submit an application for reinstatement. A disqualified student normally will not be reinstated until at least one semester has elapsed from the date of disqualification. The burden of establishing fitness is on the disqualified student, who may be required to take aptitude tests and submit to other examinations before being readmitted.
5. While students are subject to the general retention policies of the University, they are evaluated in the College on broader criteria than mere academic average. Students are reviewed for evidence of competency for teaching and are continuously evaluated as they progress in the program. Prospective teacher candidates

who do not meet the established criteria are guided toward a program that is compatible with their interests and abilities.

6. The effective date a student is academically disqualified or retained is the first day of classes of the semester following the establishment of the deficiency.

Graduation and Degree Requirements

Each candidate for graduation in a degree curriculum leading to Bachelor of Arts in Education degree is required to complete an approved program of at least 126 semester hours with a cumulative grade point index of 2.50 or above for: (1) All courses taken while a student at the University; (2) All courses included in his/her major teaching field; (3) And all professional education courses.

Departments may have graduation requirements in addition to those listed above. A student is responsible for checking and meeting departmental requirements.

Each candidate must file a written application for graduation acceptable to the College of Education Program Standards Committee and receive a recommendation for graduation from the faculty of the College of Education.

General Studies. The student should consult with his/her advisor for specific recommendations or requirements within the area of General Studies in order to build an acceptable pattern of courses and to be qualified for admission to and graduation from the College of Education. A minimum of 45 semester hours of General Studies must be completed before the student is eligible for graduation in any of the undergraduate curricula offered by the College of Education. It is anticipated that heavy emphasis will be placed on these requirements during the first two years of study before formal admission to the College of Education. These courses should represent the following areas of study: Humanities and Fine Arts, Social and Behavioral Sciences, and Science and Mathematics. Specific requirements should be arranged through an advisor.

Pass-Fail Grades. Students in the College of Education may participate in the Pass-Fail program of the College of Liberal Arts. However, no course taken for Pass-Fail may be counted toward the student's major or minor teaching field requirements or other required academic specialization.

Student Teaching

Students must be admitted to the College of Education's approved teacher education program and have completed the appropriate prerequisites to be eligible for admission to student teaching.

Students planning to student teach should contact the Director of the Office of Professional Field Experiences for specific prerequisites. Application to student teaching must be submitted in the semester prior to the semester in which the candidate intends to student teach.

Opportunities for student teaching in England are available for students in selected fields during the spring semester of each year. For information contact the Director of the Office of Professional Field Experience.

Requirements. Students admitted to student teaching must have a cumulative index of 2.50 or better and 90 semester hours of college credit. The cumulative index in the Teaching Major shall be at least 2.50.

The completion date of the last education methods course must be within two years of the beginning date of student teaching to be accepted as meeting the prerequisites.

The student's course load is limited to 16 semester hours during the semester in which he/she is teaching. All student teachers are required to attend seminars conducted by the College Supervisor. Student teachers are not permitted to take part in activities that interfere with their student teaching conferences, seminars or other activities related to teaching in the cooperating school. Student teachers are required to adhere to the calendar, rules, regulations, and philosophy of the school in which they are accepted to student teach. Applications for the appropriate semester of Student Teaching will be distributed and received; for Spring semester between September 15 and October 15; for Fall semester between March 1 and April 1.

Student Teaching Waiver. Under certain limited conditions a student may be excused from student teaching. In general the conditions apply to persons who have extensive teaching experience. Specific conditions may be discussed with the Director, Office of Professional Field Experiences.

Bachelor of Arts in Education

Successful candidates for the Bachelor of Arts in Education degree will be able to show proficiency in several areas:

1. Communication skills;
2. Knowledge of human development;
3. Use of measurement, assessment and evaluation techniques;
4. Mastery of subject matter;
5. Planning, organization and delivery of instructional activities;
6. Fostering positive student performance;
7. Understanding of the role of education in the social context;
8. Ability to make professional decisions.

The degree Bachelor of Arts in Education can provide preparation for teaching in grades K-8. The degree provides students with a thorough understanding of teaching in elementary school settings. An option in Early Childhood Education is also available and provides preparation for students to work in infant, pre-school and school settings.

The degree Bachelor of Arts in Education can also provide preparation for teaching in grades 7-12. For teaching in grades 7-12, major and minor teaching fields approved by the College of Education are offered in departments of the Colleges of Liberal Arts, Business, and Engineering and Applied Sciences. Students in the colleges listed above, may earn a bachelor's degree from that College while concurrently fulfilling certification requirements in the College of Education. Students with teaching majors in the College of Fine Arts will earn the appropriate bachelor's degree (Bachelor of Fine Arts or Bachelor of Music) from that College. The appropriate department should be consulted for statements of specific requirements.

Major Teaching Fields Available

Art	English
Asian Languages	French
Biological Sciences	General Science
Business, Office and Distributive Education	Geography
	Geology
	German
Chemistry	Health Sciences
Choral Music	History
Communication	Home Economics
Dance	Humanities
Economics	Industrial Arts
Instrumental Music	Political Science
Journalism	Russian
Mathematics	Social Studies
Physicial Education	Spanish
Physics	Theatre

The degree Bachelor of Arts in Education can also provide preparation for teaching special education in grades K-12. The degree provides students with a thorough understanding of methods used to teach mildly handicapped persons.

In all areas within the general pattern of course work, students are strongly encouraged to include the following: 1) a foreign language, particularly Spanish or a Native American language; 2) work with children in classrooms or other settings; 3) experiences in multicultural and bilingual settings.

To complete the degree requirements, students will be required to participate in practicum experience in field settings. These will vary from short-term directed experiences to long-term supervised experiences.

SPECIAL PROGRAMS

Selected Studies in Education. This program is designed for undergraduate students who are interested in the field of education but do not intend to become public school teachers. Students may wish to prepare for a variety of positions outside as well as inside educational institutions. These may be with government agencies, religious organizations, foundations, business and industry, or in private, early childhood, or higher education, and even in public elementary or secondary schools, although not usually in a formal classroom setting.

The program offers the opportunity for such students to develop individualized curriculum plans tailored to their particular needs and interests. It provides an alternative to the regular program of the College of Education. Any undergraduate student in the College of Education may present a Selected Studies in Education plan. The plan must be developed in close consultation with a faculty advisor in the College of Education and must have the endorsement of the Undergraduate Standards Committee of the College. To be approved, a Selected Studies in Education plan must demonstrate that it is significantly different from established programs at the University in both intent and content.

Interested students should obtain application forms and other pertinent materials from the Office of Student Services.

Special Programs of Teacher Preparation. Several areas of concentration are available on the undergraduate level in connection with any of the undergraduate curricula. These are available as a sequence of courses to be taken in addition to the regular requirements of the undergraduate curriculum.

Library Science. Students desiring endorsement as a school librarian (K-12) must complete the requirements for teacher certification and a program approved by the Department of Educational Technology and Library Science. Undergraduates will complete the library science minor which consists of 24 semester hours, including 15 hours of prescribed library science courses, an approved elective in Library Science or Instructional Media, and 6 hours of student teaching in a school library. Students may also select library science as a field of specialization at the graduate level.

Indian Education. Students pursuing a major teaching field in elementary education may, with the approval of their advisors, elect to take a special sequence preparatory to the teaching of American Indian children. This is appropriate for those who will have only a few Indian children in a classroom, or for those who will have a classroom composed only of Indian children. Such students shall be required to complete satisfactorily the basic elementary program.

Students pursuing a major teaching field in secondary education may also take this special training for teaching American Indian children. Such students shall be required to complete satisfactorily the basic secondary major.

Teaching in Multicultural or Bilingual Education. A modern teacher is called upon to provide instruction in a wide variety of classroom settings. In these settings will be children of different races or ethnic backgrounds. Often there will be children who speak little or no English or who are fluent in English and some other language. Students are encouraged to anticipate such assignments and to work to prepare for them.

Certification for Teaching.

The State of Arizona is the legal entity responsible for certifying teachers within the State. The delegated responsible agency is the Arizona Department of Education. The laws of the State and rules and procedures of the Department govern the issuance of certificates. From time to time changes occur in the laws and rules. Students are advised to be informed about the laws and rules. The Office of Student Services keeps up-to-date information sheets describing all requirements for certification.

The College of Education is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary, secondary and special education teachers and for other professional positions. Students who complete the appropriate curriculum and applicable State requirements are recommended for certification to the Arizona Department of Education. They are also eligible for certification in other states.

Certification as a teacher should not be understood as employment. Teaching is a competitive field in which more persons seek positions than there are available openings. In general, teacher candidates who have special skills or are prepared to teach in more than one area are given preference by prospective employers.

Counselor Education

The doctoral programs of the Department of Counselor Education are approved in Counseling Psychology by the American Psychological Association.

PROFESSORS:
BLACKHAM, CABIANCA, GUINOUARD, HEIMANN, McWHIRTER, NOBLE, SNYDER, YAMAMOTO

ASSOCIATE PROFESSORS:
ROBINSON (ED B-401A), ARCINIEGA, ASHER, CHRISTIANSEN, CHURCHILL, CUMMINGS, GROSS, MAZEN, MILLER, SHELL

ASSISTANT PROFESSOR:
KINNIER, MOORE

CED 512 Introduction to the Helping Relationship. (3) F, S, SS
Introduction to the skills used in the helping professions and an examination of the settings in which they occur.

522 Personality Development. (3) F, S, SS
Interaction of affective and cognitive factors in personality development at different age levels. Various personality theories examined.

523 Psychological Tests. (3) F, S, SS
Standardized tests in the study of the individual with emphasis on test score interpretation in counseling.

534 Occupations and Careers. (3) F, S, SS
The world of work, career development, education and training for occupational entry and mobility.

545 Analysis of the Individual. (3) F, S, SS
Theory and methods commonly used in studying the individual. Observational methods, diagnostic interviews, structured and semi-structured methods for assessing personality. Prerequisite or corequisite: CED 522.

567 Group Procedures. (3) F, S, SS
Factors determining interaction, effectiveness and morale in small groups. Techniques of observation, assessment and leadership.

577 Counseling. (3) F, S, SS
Principles and application of counseling with particular emphasis on counseling theories. Prerequisites: CED 512, 523, 534, 545, 567, and admission to M.C. or CED doctoral degree program.

613 Child Counseling. (3) N
Applications of counseling theory in working with children in clinics and elementary schools. Practicum integrated with didactic instruction. Prerequisite or corequisite: CED 680 and approval of instructor.

622 Group Counseling. (3) F, S, SS
Theories and methodologies used in group counseling. Prerequisite: CED 577.

634 Organizational Development and Planned Change. (3) S
Organizational/individual dynamics: theory, analysis, techniques, and consultation/intervention strategies used in organizational development. Field consultation projects. Prerequisite: CED 567 and 577.

644 Psychology of Careers. (3) S
Structural and developmental theories of occupational choice. The role of counseling in the development of a career. Prerequisite or corequisite: CED 577.

645 Professional Issues and Ethics. (3) F, S, SS
Ethical, legal, and professional issues of concern to the practicing counselor. Includes confidentiality, family conflict, child rights, certification, malpractice, and use of client information. Prerequisite: CED 577.

655 Student Development Programs in Higher Education. (3) A
Emerging conceptual models of student development. Overview of student personnel and student affairs programs in community colleges, four-year colleges and universities. Observation on campuses.

656 The American College Student. (3) A
Selected theories of human development with application to academic/socio-psychological learning tasks of post-secondary environmental influences, including faculty expectations, campus sub-cultures.

666 Comparative Theories of Personality. (3) F
Comparative analysis of personality theories in relation to counseling practices. Prerequisites: CED 522, 577.

667 Patterns of Behavior Disorders. (3) A
Etiology, dynamics and treatment of a variety of psychological problems including traumatic reactions, anxiety, somatoform, dissociative, personality, affective, psychosexual and psychotic disorders. Prerequisite: CED 577.

670 Behavioral Counseling. (3) A
Theory, procedures and applications of behavior modification and therapy in working with children, parents, and adult clients in school, clinic and institutional settings. Didactic instruction, analysis of individual and group problems and directed experiences. Prerequisites: CED 680 and approval of instructor.

671 Multicultural Counseling. (3) A
Provides awareness of the influence of socio-cultural variables on human development and explores implications for counseling minority populations. Prerequisite: CED 577.

672 Marriage and Family Counseling I. (3) F
Introduction to marriage and family counseling theories. Emphasis is on a systems-communication model utilizing co-counseling. Prerequisite: CED 577/622, CED 680 and approval of instructor.

673 Marriage and Family Counseling II. (3) S
Advanced analysis and application of systems communication counseling. Focus on marital and sexual counseling. Practicum recommended. Prerequisites: CED 672 and approval of instructor.

674 Women: Sense of Identity. (3) F
Examines counseling techniques and developmental issues for exploration of women's sense of identity and factors contributing to it including social/psychological and cultural influences which particularly impact on the development of women.

675 Counseling Interventions in Stress Management. (3) S
Theory, procedures, and application of stress management techniques including biofeedback, meditation, relaxation, autogenic therapy, visualization, and imagery. Concurrent practicum (CED 680). Prerequisite: CED 577, 680, and approval of instructor.

677 Advanced Counseling. (3) N
Counseling systems and theories and their practical application in case management; comparative case analysis. Prerequisite: CED 577.

681 Supervised Practice. (3) F, S
Supervised experiences in schools or community agencies. Prerequisites: CED 680 and approval of instructor.

Special Courses: CED 494, 498, 499, 500, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 600, 680, 683, 684, 690, 691, 692, 693, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

Educational Administration and Supervision

(Member: University Council for Educational Administration)

PROFESSORS:
METOS (ED 107), HUNNICUTT, NORTON, STOUT, WEBB, WOOTTON

ASSOCIATE PROFESSORS:
DRAKE, FARRAR, LEVAN, WALKER

EDA 501 Competency/Performance in Educational Administration. (6) F, S, SS
Nature of educational administration, foundational knowledge of competency in administration.

511 School Law. (3) F, S, SS
Constitutional, statutory and case law that relates to all school personnel, pupils, the school district and other governmental units. Contracts, dismissals, tenure, retirement, pupil injuries, liability of personnel and district, school district boundary changes, bonding.

521 Evaluation of Teaching Performance.(3) N
In-depth analysis of legal basis of teacher appraisal, teacher competency, measurement of teacher performance, and application of performance appraisal systems.

524 Theory and Application of Educational Administration. (3) F, S, SS
History and development of public school administration in the United States; current organizational patterns for public education at local, intermediate, state, and national levels; current theoretical positions in educational administration.

525 Human Relations and Societal Factors in Educational Administration. (6) F, SS
Interrelations between problems of educational administration and interdisciplinary social sciences. Communications skills, morale, authority and perception. Concepts from political science, economics, and social-psychology useful to the administrator. Activities include computer simulation laboratory and off-campus assignment.

526 Instructional Supervision. (3) F, S, SS
Administering curriculum improvement, in-service education, evaluating and improving teaching competence; administrative instructional responsibilities.

527 Managerial Functions in School Administration. (3) S, SS
Relates to the work of the central district office staff and the school principal. Use of human resources, property management, and organization and management of time.

538 Administration of the Community School. (3) F, S, SS
Philosophy, history, organization and operation of the community-centered school. Introduction of the community education concept into a school system and making it operational.

544 Public School Finance. (3) F, SS
Measures of ability, efforts, and educational need; capital outlay funding; tax revenues; federal, state, and local financing alternatives; and, major issues and trends in the financing of public education.

548 Community Relations in Education. (3) F, S, SS
Administrative factors of primary importance in developing community involvement in public schools. Emphasis on theory and skill of school system and individual communication.

549 Programming and Financing Community Education. (3) N
In-depth investigation of component programs effective as a vehicle for community education in area schools; plans which help schools change; models for funding community education. Prerequisite: EDA 538 or approval of instructor.

555 Educational Facility Planning. (3) S, SS
School building needs, educational planning for facilities, responsibilities of architects, duties of contractors, equipping and furnishing of school buildings.

568 Role and Responsibility of Supervising Teacher. (3) N
Experiences and content for those planning to become supervisors of student teaching in teacher-education programs. In-service training for those in student teaching.

571 School Business Management. (3) A
Purchasing, budgeting, accounting, payroll management, auditing, financial reporting, insurance and administration of nonteaching personnel and services.

573 School Personnel Administration. (3) S, SS
Organization for personnel services; development of policy to govern selection, orientation, placement, remuneration, transfers, separations, and development of morale among instructional and noninstructional personnel.

576 The School Principalship. (3) F, S, SS
Problem and laboratory approaches used to provide application of administrative activities of elementary and secondary schools.

634 Instructional Leadership. (3) N
Curricular practices and processes used by instructional leaders who plan, organize and coordinate the professional activities in elementary and secondary schools. Prerequisite: EDA 526.

658 Problems and Issues in Administering Community Education. (3) N
Provides community educators with an understanding and skill in school law, plant management, personnel administration, business practice, school legislation, community education history, research and utilization of local resources. Prerequisites: EDA 548 and 549.

675 Politics of Education. (3) N
Social science theory and research are used to consider the political context of educational policy making.

676 The School Superintendency. (3) S
Critical examination of the school superintendency and the primary functions of this educational position. The duties, responsibilities, activities and problems of the school superintendent are included. The unique leadership role of the school superintendent is examined. Prerequisite: approval of instructor.

679 Administration of Special Programs in Education. (3) N
For personnel administering special educational services; responsibilities of superintendents, principals, supervisors, and directors for special education, student personnel, audiovisual, library science and others.

711 Administrative Leadership. (3) A
Emphasis on research in leadership; application of research findings to administrative and supervisory functions in educational endeavors. Prerequisites: 30 semester hours in Educational Administration; admission to doctorate.

722 Administration of Instructional Improvement. (3) F
Recent research relating to administrative and supervisory responsibilities for the improvement of the educational program. Effective processes by administrators, supervisors, consultants and coordinators. Prerequisites: 30 semester hours in Educational Administration; admission to doctorate.

733 Administrative Management. (3) A
Recent research relating to school management. School finance, law, buildings, transportation, food services and supply management. Prerequisites: 30 semester hours in Educational Administration; admission to doctorate.

Special Courses. EDA 498, 580, 583, 590, 591, 592, 593, 594, 598, 599, 680, 683, 684, 690, 691, 692, 693, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

NOTE: *A laboratory is maintained in the Southwest Regional Center for Community Education Development covering materials and practices in the field of Community Education. The use of the laboratory may be scheduled with the secretary in Room 113, Farmer Education Building.*

Educational Psychology

PROFESSORS:
KULHAVY (ED B-301), FRY, GRINDER, HELMSTADTER, KERR, KRUS, MEYER, NELSEN, SATTLER, STOCK, VAN WAGENEN

ASSOCIATE PROFESSORS:
BETZ, CARROLL, HARRIS, OKUN

ASSISTANT PROFESSORS:
ARGULEWICZ, BURKE

EDP 310 Educational Psychology. (1-6) F, S, SS
Human behavior in educational situations presented through instructional modules. Students may re-enroll for credit to a total of six hours.

454 Introduction to Descriptive Data Analysis and Measurement. (1-3) F, S, SS
The nature of measurements and data. Frequency distributions, their descriptors and probabilities derived from them. Derived scores, correlation and regression. Qualities of tests.

510 Essentials of Classroom Learning. (3) F, S, SS
Theoretical and empirical foundations of learning in the classroom milieu. Critical exposure to research and method in instructional psychology.

514 Psychology of the Adolescent. (3) F, S, SS
Cognitive, physical, and social development of adolescents in contemporary society. Impact of family, school, and work place on adolescent development. Prerequisites: PGS 100 or EDP 310 or equivalents.

530 Theoretical Issues and Contemporary Research in Human Development. (3) S
Psychological theories, research and methods relevant to human development emphasizing the relations between early development and later performance.

532 Psychology of Exceptionality. (3) S
General psychological theory and experimental research relevant to exceptionality, emphasizing implications for educational programs which recognize unique learner characteristics. Field work.

534 Principles of Behavior Modification. (3) F
Principles of conditioning as applied to behavior modification; current research on the experimental analysis of behavior in educational psychology.

540 Theoretical Views of Learning. (3) F, S, SS
Classical and cognitive theories of learning, plus recent orientations. Illustrative experimental and rational foundations; implications for educational practice.

542 Learning and the Training-Evaluation Process. (3) S
Critical review and evaluation of research on learning variables relevant to acquisition and retention of instructional materials. Laboratory experience.

543 Life-Span Prose Comprehension. (3) S
Examination of prose learning across the adult lifespan: research, models, methods, discourse analysis and scoring procedures. Prerequisite: EDP 540 or equivalent.

544 Psychology of Reading. (3) F
Alternate analyses of the reading process; designs and procedures for investigating instructional and noninstructional variables related to reading achievement. Prerequisite: EDP 454.

550 Theories of Educational Measurement. (3) S
Methodology of educational measurement with emphasis on test reliability, validity, homogeneity, and structure. Prerequisite: EDP 454.

551 Expository Writing and Research Heuristics. (3) F
Weekly writing practice making use of heuristic concepts and expository principles. The construction of rationales for research problems. Logic and coherence in rhetoric. Writing style appropriate to exposition.

552 Inferential Techniques of Data Analysis. (1-3) F, S, SS
Inferential procedures in educational research; probability, sampling design, statistical inference, hypothesis testing, and basic experimental design. Prerequisite: EDP 454 or passing score on qualifying exam.

554 Multivariate Procedures in Data Analysis. (3) F, S, SS
Contrasts, multiple classification analysis of variance and covariance, multivariate analysis of variance and multiple linear regression. Prerequisite: EDP 552, or passing score on qualifying exam.

555 Computer Utilization for Data Processing in the Behavior Sciences. (3) F
Introduction to data processing skills through the uses of major statistical programming packages. Prerequisites: EDP 454 and 552, 552 may be taken concurrently.

556 Data Processing Techniques in Measurement and Research. (3) S
Advancement of statistical design and measurement skills through development of data processing techniques and usage of special programs and data processing programs. Prerequisite: EDP 554.

560 Individual Intellectual Assessment. (1-5) F, S
Experience in administering and interpreting individual tests. Theoretical basis for ability testing, ethical considerations, and diagnostic use of test results. Initial enrollment, 3 hour minimum. Laboratory experience. Prerequisite: admission to a program in professional psychology or approval of the instructor.

562 School Psychology: Theory and Practice. (3) F
Development and present status of school psychology: overview of assessment and intervention strategies and professional issues.

563 Interventions in School Psychology. (3) S
Examination of interventions and intervention research relevant to school psychology practice. Field experience. Prerequisite: school psychology program or approval of instructor.

566 Diagnosis of Learning Difficulties. (3) F
Clinical diagnosis of learning difficulties emphasizing specific academic problems. Use and interpretation of diagnostic instruments in practical school situations. Prerequisites: EDP 560 and 562, or equivalents and permission of instructor.

754 Advanced Multivariate Analysis. (3) S
Multivariate experimental design, multivariate multiple comparison procedures, confidence intervals, covariance structure analysis, and analysis of qualitative data. Prerequisite: EDP 554.

Special Graduate Courses: EDP 394, 494, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 680, 683, 684, 690, 691, 693, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

Educational Technology and Library Science

PROFESSORS:
HIGGINS, GERLACH, NILSEN, SATTERTHWAITE, SCHON, SULLIVAN
ASSOCIATE PROFESSORS:
BEYARD-TYLER (ED B-146), KENNEDY
ASSISTANT PROFESSORS:
McISAAC

EDUCATIONAL TECHNOLOGY

EDT 405 Competency-Based Instruction. (3) F, S, SS
Students develop instructional objectives, select learning activities, and design assessment procedures for competency-based instructional programs.

501 Foundations of Educational Technology. (3) F
Introduction to instructional development. An examination of accomplishments and problems in the field.

502 Design and Development of Instruction. (3) F, S
Design, development, and formative evaluation of objectives-based instructional materials.

503 Research Techniques for Instructional Development. (3) S
Procedures for analyzing the effects of alternative instructional practices.

504 Educational Evaluation. (3) S
Evaluation procedures in instruction and training.

584 Educational Technology Internship.(1-6) F, S, SS
Prerequisites: EDT 501, EDT 502, IME 521 (or concurrent enrollment) and permission of instructor.

780 Advanced Instructional Development. S
Conducting and documenting selected instructional development activities. Prerequisites: EDT 502 and permission of instructor.

792 Advanced Instructional Research. (3) F
Design and execution of instructional research on selected topics. Prerequisite: EDT 503 and permission of instructor.

Special Courses: EDT 494, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 680, 683, 684, 690, 691, 692, 693, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

COMPUTER BASED EDUCATION

CBE 321 Computer Literacy. (3) F, S, SS
Survey of the role of computers in K-12 schools. Infusion of computer concepts into curriculum and instruction.

323 *Basic Computer Programming* (3) F, S
Introduction to use of BASIC for instruction. Application of computer programming principles to effective instructional programs.

522 Evaluating Computer Materials. (3) F, S, SS
Selection, utilization, and evaluation of computer hardware and software for use in schools.

523 Computer Programming for Instruction. (3) F, S
Computer programming in BASIC for instructional purposes. Students develop computer-controlled instructional programs.

637 Computers in Elementary School Curriculum. (3) F, S, SS
Introductory experiences with educational uses of computers; computer awareness, family/societal impact, classroom applications/software, curriculum development, BASIC/LOGO language, microcomputers.

Special Courses: CBE 590, 591, 592, 598, 692, 792.

EDUCATIONAL MEDIA

IME 411 Audiovisual Materials and Procedures in Education. (3) F, S, SS
Preparation and utilization of audiovisual materials and equipment in teaching. Lecture and laboratory.

455 Cinema and Television. (3) N
Structure, development, and behavioral effects of theatrical motion pictures.

521 Design of Instructional Media. (3) S
Preparing specifications for instructional television, film, *and slide/tape programs.*

522 Audiovisual Production Techniques in Education. (3) SS
Production and use of audiotapes, video tapes, slide programs, and graphic materials. Lecture and laboratory.

523 Audiovisual Resources for the Classroom. (3) N
Survey and evaluation of commercially available audiovisual materials for the classroom and library media center.

524 Instructional Photography. (3) F, S
The camera, film exposure, composition and lighting. Dark room experiences in developing and printing black and white film. Lecture and laboratory.

525 Instructional Graphics. (3) N
Principles of design, production and utilization of graphic media in instructional materials. Lecture and laboratory.

527 Instructional Television. (3) F, S
Design and production of instructional programs for television. Lecture and laboratory.

528 Advanced Photographic Media Production. (3) S
Design and production of multi-media instructional programs. Emphasis on slide/tape format. Prerequisite: IME 524 or approval of instructor. Lecture and laboratory.

560 Current Issues and Problems in Audiovisual Education. (3) F
Critical analysis of current practices in instructional media. Prerequisite: six hours in IME or approval of instructor.

***IME 584.* Instructional Media Internship.**(1-6) F, S, SS
Prerequisites: EDT 501, 502, IME 521 (or concurrent enrollment) and permission of instructor.

Special Courses: IME 494, 498, 499, 500, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 35-36.)

LIBRARY SCIENCE

LIS 410 Children's Literature. (3) F, S, SS
Selecting, analyzing, and using modern and classic literature with young readers.

411 Advanced Studies in Children's Literature. (3) N
Folk and modern literature for children. Storytelling, book talks, puppetry, and creative drama as motivational techniques. Prerequisite: LIS 410 or approval of instructor.

440 Classification and Cataloging. (3) F
Descriptive cataloging and Dewey Decimal Classification of print and nonprint library materials.

461 Selection of Library Materials. (3) F
Principles and procedures used in the selection of materials for the school library.

463 Library Materials for Children. (3) F
Selecting and using print and nonprint materials to support the elementary school curriculum.

464 Library Materials for Adolescents. (3) F
Selecting and using print and nonprint materials to support the secondary school curriculum.

465 Literature for Hispanic Youth/Literatura para Jóvenes Hispanoparlantes. (3) S
Selecting, analyzing, and utilizing literature for Hispanic and Spanish-speaking children and adolescents.

471 Basic Reference Resources. (3) S
Providing reference service in the school library. Content and use of basic resources.

481 School Library Administration. (3) S
Prerequisites: Nine hours from among the following: LIS 440, 461, 463, or 464, 471.

510 Library Automation. (3) S
Library uses of computers. Fundamental concepts and issues in the field of library automation. Prerequisites: LIS 471 and 481 or approval of instructor.

533 Current Library Problems. (3) F
Critical analysis of current practices and problems in school librarianship. Prerequisites: LIS 481 or approval of instructor.

534 Evaluation of Literature for Young Readers. (3) S
Applying standards of literary criticism to literature for young readers. Prerequisite: LIS 410 or approval of instructor.

584 School Library Internship. (1-6) F, S
Prerequisites: LIS 440, 461, 463 or 464, 471, 481. Concurrent enrollment in LIS 481 is permitted.

Special Courses: LIS 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 35-36.)

Elementary Education

PROFESSORS

ENGELHARDT (ED B-225), BITTER, DOYLE, GARCIA, MALONE, MOYER, RAY, SEARFOSS, SILVAROLI, STROM, WALLEN

ASSOCIATE PROFESSORS

ANDERSON, CHRISTINE, COHEN, EDELSKY, EEDS, GREATHOUSE, HARDT, JACOBS, KAMINS, KNAUPP, KNIEP, PETERSON, SCHALL, STALEY, TIPPECONNIC

ASSISTANT PROFESSORS

FLORES, GOMEZ, VALLEJO

Laboratory and off-campus experiences may be included in courses marked with an asterisk.

BILINGUAL EDUCATION

BLE 498 Introduction to BLE. (3) F, S
Provides an overview of models of bilingual education and focuses on general teaching strategies for bilingual classrooms. Primarily Spanish-English considerations.

535 Sociolinguistic Issues in Bilingual Education. (3) F
Survey of major theoretical issues (e.g., language situations, communicative competence, language attitudes) interrelating language, social processes and bilingual education.

543 Bilingual Education Models. (3) F
Bilingual education programs in other countries; analysis of political, social, economic, and educational implications; practice in planning bilingual education curricula.

See also offerings under MCE, SED and SPE on pages 199, 200 and 202.

Special Courses: BLE 394, 494, 498, 499, 592, 593, 594, 598, 690, 691, 784, 790, 791, 799. (See pages 35-36.)

EARLY CHILDHOOD EDUCATION

ECD 308 Introduction to Early Childhood Education.* (3)
An overview of the early childhood education field including professional options, historical roots and current theories and policy developments at national, state and local levels.

310 Educational Environments: Infants/Toddlers.* (3)
Organizing, planning and implementing educational practices based on developmental theories which will enable early childhood educators to provide optimal learning environments for infants and toddlers. Prerequisite: EED 313.

311 Social Studies in Early Childhood Education.* (3)
F, S, SS
Development of democratic living in all areas of the curriculum. Objectives, problem solving, selection of content, scope and sequence, construction of instructional material and resources. Experiences with children.

312 Educational Environments: Nursery-Kindergarten.* (3) F, S, SS
Considers all aspects of curriculum. Philosophy, principles, practices, problems and evaluation in the integrated experience program.

322 Communication Arts in Early Childhood Education.* F, S, SS
Factors affecting language development. Setting conditions for learning in listening, speaking, reading and writing. Proficiency in handwriting and spelling required. Prerequisite: ENG 213 or equivalent.

378 Practicum in ECE. (3)
Provides a field-based experience in selected early childhood settings (outside the public schools prior to student teaching.) Prerequisites: EED 313, ECD 308.

411 Early Childhood Education: Programs and Materials.* (3) F, S, SS
Principles, experiments, research studies, and recent trends as factors related to the education of children through eight years of age. Prerequisite: ECD 312.

522 Developmental Social Experiences in Early Childhood Education. (3) S
Materials, techniques, esthetic expression, creative activities and values in the integrated curriculum. Prerequisite: ECD 311 or equivalent.

525 Communication Arts in Early Childhood Education. (3) F
Problems and trends of current programs and oral language development. Effort to bring together language acquisition findings with educational practices. Opportunity for self-directed learning/study. Prerequisite: ECD 322 or equivalent.

527 Mathematics in Early Childhood Education. (3) F
Theory and practice in the use of manipulative materials for teaching mathematics to preschool and primary grade children. Prerequisite: EED 380 or equivalent.

555 Modern Practices in Early Childhood Education. (3) F, S
Trends and practices, instructional and resource materials, methods and techniques in early childhood education. Prerequisite: ECD 312 or equivalent.

744 Evaluative Procedures: Young Children. (3) S (A)
A critical examination and use of developmentally appropriate evaluative procedures for children birth through eight.

Special Courses: ECD 294, 298, 394, 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 680, 683, 684, 690, 691, 692, 693, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

ELEMENTARY EDUCATION

EED 313 Child Development.* (3) F, S, SS
Principles underlying the total development of the child during the pre-school and elementary school years with observations in a variety of settings. Enhancement and understanding of the child in the physical, intellectual, social, and emotional areas of development. Discussion sessions may be scheduled.

320 Teaching Science to Children.* (3) F, S, SS
Develops students' personal philosophies of the nature of elementary school science; why teach science and how children learn science. Knowledge and skills in planning instruction, using instructional models, integrating the curriculum, employing current science programs and materials and evaluating children's learning. Laboratory sections.

333 Communication Arts in the Elementary School.* (3) F, S, SS
Factors affecting language growth. Setting conditions for teaching oral and written language development. Prerequisite: ENG 213 or equivalent.

344 Elementary School Organization and Management.* (3) F, S, SS
Overall program of the elementary school. Practical approaches to planning, organizing and managing the classroom.

355 Social Studies in the Elementary School.* (3) F, S, SS
The core function of social studies, scope and sequence, unit organization, methods of instruction, materials and resources for learning.

366 Observation and Participation. (1-3) F, S, SS
Students observe and work directly with elementary children in a classroom situation. Includes a critical evaluation of the student's experiences. Y grade only.

380 The Teaching of Mathematics in the Elementary School.* (3) F, S, SS
A beginning course in methods and materials used. Laboratory experiences with curriculum materials. Laboratory sections. Prerequisite: MAT 180 or its equivalent.

478 Student Teaching in the Elementary School. (3-15) F, S, SS; Staff
Supervised teaching in the area of specialization. A synthesized experience in curriculum, instruction, and classroom management. Prerequisite: EDF 200 or EED 366, 27 semester hours of the core in major field and admission to elementary teacher education curriculum.

511 Principles of Curriculum Development. (3) F, S, SS
Contemporary curriculum theories. Curriculum as an interrelated entity. Principles of conceiving and effecting change.

513 Child Development. (3) F, S, SS
Continuing analysis of principles, theories and research concerning the elementary school child and his development. An integrated approach to the study and facilitation of wholesome educational and psychological development.

526 Communication Arts in the Elementary School. (3) S
A critical examination of language arts curriculum and teaching practices in the elementary school, with a survey of approaches to teaching various forms of written composition, oral expression, and listening. Opportunities for self-directed study.

528 Social Studies in the Elementary School. (3) F
Problems and trends of current programs. Development of a balanced and articulated program of social studies. Prerequisite: EED 355 or equivalent.

529 Science in the Elementary School. (3) F, S
Problems and trends of current programs. Development of a balanced and articulated science program. Prerequisite: EED 320 or equivalent.

530 Outdoor Education. (3) S, SS
Use of various outdoor settings as laboratories for classroom related experience, study, observation, inquiry, research, and recreation.

537 Mathematics in the Elementary School. (3) F, S, SS
Contemporary mathematics programs used in elementary schools. Content, materials, and approaches to instruction. Prerequisite: EED 380 or equivalent.

581 Diagnostic Practices in Mathematics. (3) S, SS
Specific skills in diagnosing/treating children's learning difficulties in mathematics. Includes practicum experiences in identifying strengths/weaknesses and initial remediation. Laboratory sections. Prerequisite: EED 537 or instructor's permission.

585 Contemporary Issues in Elementary Education. (3) S, SS
Designed to develop understanding of a broad range of contemporary humanistic issues and to assist students in establishing an informed, professional view. Prerequisite: EED 511 or equivalent.

Special Courses: EED 294, 298, 394, 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 680, 683, 684, 690, 691, 692, 693, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 35-36.)

INDIAN EDUCATION

IED 411 Foundations of Indian Education.* (3) F, S
Historical development of Indian affairs and Indian education, including contemporary educational issues, traditional Indian concepts of education and Indian cultures.

422 Methods of Teaching Indian Students.* (3) F
Philosophies, methodologies, and materials used in Indian education. Examination of local and tribal classroom materials. Experimentation with new teaching concepts. Prerequisite: IED 411.

424 Curriculum and Practices for Indian Education.* (3) S
Curricula, philosophies, and research in Indian education. Techniques for curriculum development, change, and improvement. Prerequisite: IED 411.

433 Counseling the Indian Student.* (3) A
Techniques and methods used in counseling with emphasis on understanding Indian cultures and values. Experimentation with new counseling concepts. Prerequisite: IED 411.