ASU BULLETIN

Arizona State University

General Catalog
1988-1989

$4.00

Arizona State University

General Catalog 1988-89

Al co eges and departments estab sh certa n academic requ rements wh ch must be met before a degree s granted. These requ rements concern such th ngs as curr cula and courses, majors and minors, and campus resi dence. Advisors, d rectors depart ment cha rs and deans are ava lable to he p the student understand and arrange to meet these requ rements, but the student s respons b e for fu f ll ng them. At the end of a student's course of study if requirements for graduat on have not been satisf ed, the degree w'll not be granted. For th's reason t s important for a stu dents to acquaint themse ves with al regulations and to rema n currently nformed throughout the r college ca reers and to be respons b e for com pleting requ rements Courses, pro grams and requirements descr bed n the cata og may be suspended, de leted, restr cted supplemented or changed n any other manner at any t me at the sole discretion of the Uni vers ty and the Ar zona Board of Re gents The cata og does not estab sh a contractual re at onship but t sum marizes the tota requirements which the student must presently meet be fore qua ify ng for a facu ty recom mendation to the Ar zona Board of Regents to award a degree

Address requests for add t onal nformat on to.

DIRECTOR OF UNDERGRADUATE ADMISSIONS

AR ZONA STATE UN VERSITY

TEMPE, AR ZONA 85287 0705

Ar zona State Un vers ty reserves the r ght to change w thout notice any of the materia s nformat on requ rements, regulations pub shed n th s *Catalog*

Refer to Append x A page 524 for Ar zona State Un vers ty s Statement on Grievances of Discr m nat on

No emp oyee agent, or nst tut on under the jurisdiction of the Ar zona Board of Regents sha discr m nate or reta ate aga nst any student, employee, or other nd v dua , because of such nd vidua 's rel g ous be ef or pract ce or any absence thereof Furthermore adm n strators and facu ty members are respons b e to reasonab y accommodate nd v dua re ig ous practices A refusa to accommo date s ust f ed on y when undue hardship wou d resu t from each ava ab e a ternat ve of reasonable accommodation Relig ous ho days are pub shed n the *ASU Insight* and or the *University Bulletin*, off c a faculty staff pub cations, at the beg nn ng of each semester

Arizona State Un vers ty comp es w th the Fam ly Educat onal R ghts and Pr vacy Act of 1974 as amended (see page 37)

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Departments: Aerospace Studies; Anthropology; Botany; Chemistry; English; Family Resources and Human Development; Foreign Languages; Geography; Geology; Health and Physical Education; History; Mathematics; Microbiology; Military Science; Philosophy; Physics; Political Science; Psychology; Religious Studies; Sociology; Speech and Hearing Science; Zoology.

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN

School of Architecture.
Departments: Design; Planning.

COLLEGE OF BUSINESS

Schools: Accountancy; Health Administration and Policy.
Departments: Decision and Information Systems; Economics; Finance; General Business; Management; Marketing; Purchasing, Transportation, Operations.

COLLEGE OF EDUCATION

Division of Curriculum and Instruction: Programs: Adult Education/Selected Studies; Early Childhood; Elementary Education; Humanities Education; Media/Computer-Based Education; Multicultural Education; Reading/Library Sciences; Secondary Education; Special Education.
Division of Educational Leadership and Policy Studies: Programs: Educational Administration and Supervision; Higher Education; Social and Philosophical Foundations.
Division of Psychology in Education: Programs: Counseling; Counseling Psychology; Educational Psychology; Educational Technology.

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

School of Agribusiness and Environmental Resources.
School of Construction and Technology: Departments: Aeronautical Technology; Construction; Electronics and Computer Technology; Industrial Technology; Manufacturing Technology.
School of Engineering: Departments: Chemical, Bio and Materials Engineering; Civil Engineering; Computer Science; Electrical and Computer Engineering; Industrial and Management Systems Engineering; Mechanical and Aerospace Engineering.

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Schools: Art; Music.
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COLLEGE OF LAW

COLLEGE OF NURSING

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SCHOOL OF SOCIAL WORK

ASU WEST CAMPUS

GRADUATE COLLEGE

SUMMER SESSIONS

OFF-CAMPUS ACADEMIC SERVICES

University Calendar

Fall Semester	1988
Priority Date for Receipt of Undergraduate Admissions or Readmission Credentials	July 22, F
Orientation and Advisement for New Students	Aug. 15-19, M-F
New Faculty Orientation	Aug. 18, Th
Registration and Drop/Add	Consult *Schedule of Classes*
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Unrestricted Withdrawal Deadline	Sept. 16, F
* December Graduation Filing Deadline (no late fee required)	Oct. 14, F
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Reading Day	Dec. 9, F
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Commencement	Dec. 16, F
Mid-Year Recess Begins	Dec. 17, Sa

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Registration and Drop/Add	Consult *Schedule of Classes*
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* May Graduation Filing Deadline (no late fee required)	Mar. 17, F
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Restricted Complete Withdrawal Deadline	Apr. 27, Th
Instruction Ends	May 3, W
Reading Day	May 4, Th
Final Examinations	May 5-6, 8-11 F-Sa, M-Th
Commencement	May 12, F

* Special academic recognition for students can only be assured if the graduation application deadline is met.

Summer Sessions	1989
Instruction Begins (First 5-week Session)	June 5, M
Instruction Begins (8-week Session)	June 5, M
Unrestricted Withdrawal Deadline (First 5-week and 8-week Session)	June 12, M
Restricted Course Withdrawal Deadline (First 5-week and 8-week Session)	June 23, F
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Holiday	July 4, T
First Five-Week Session Ends	July 7, F
Instruction Begins (Second 5-week Session)	July 10, M
Unrestricted Withdrawal Deadline (Second 5-week Session)	July 17, M
Restricted Complete Withdrawal Deadline (8-week Session)	July 21, F
Eight-Week Session Ends	July 28, F
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Restricted Complete Withdrawal Deadline (Second 5-week Session)	Aug. 4, F
Second Five-Week Session Ends	Aug. 11, F
Commencement	Aug. 11, F

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Restricted Complete Withdrawal Deadline	Aug. 11, F
Second Session Ends	Aug. 18, F

* Special academic recognition for students can only be assured if the graduation application deadline is met.

1988

JULY

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General Information

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, departmental 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.

History of Arizona State University

On February 26, 1885, House Bill 164, An Act to Establish a Normal School in the Territory of Arizona, was introduced in the Thirteenth Legislative Assembly of Arizona Territory by John Samuel Armstrong. The Bill, strongly supported by Charles Trumbull Hayden of Tempe, passed the House on March 6, the Council on March 11, and was signed by Governor F. A. Tritle on March 12, 1885–thereby founding the institution today known as Arizona State University. Instruction was instituted on February 8, 1886, when 33 students met in a single room under the supervision of Principal Hiram Bradford Farmer.

The institution began with the broad obligation to provide "instruction of persons...in the art of teaching and in all the various branches that pertain to good common school education; also, to give instruction in the mechanical arts and in husbandry and agricultural chemistry, the fundamental law of the United States, and in what regards the rights and duties of citizens."

With the growth of the state, especially the surrounding Phoenix metropolitan areas, the school has carried forward this charter, accompanied by successive changes in scope, name and governance. On March 8, 1945, the three state institutions of higher learning came under the authority of one Board of Regents. By vote of the people, on No-

vember 4, 1958, the name Arizona State University replaced the previous name, Arizona State College.

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 or affiliated with the following national bodies:

Architecture and Environmental Design: The program in Architecture leads to the Master of Architecture degree, which is accredited by the National Architectural Accrediting Board. The Bachelor of Science in Design with a major in Interior Design is accredited by the Foundation of Interior Design Education and Research. The following programs maintain affiliations with the following accrediting agencies: Planning, American Planning Association; Industrial Design, Industrial Design Society of America.

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.

Fine Arts: National Association of Schools of Music.

Law: American Bar Association, Association of American Law Schools.

Liberal Arts and Sciences: American Chemical Society, American Council on Teaching Foreign Language, American Dietetic Association, American Medical Association, American Psychological Association, American Speech-Language-Hearing Association, Committee on Allied Health Education, Modern Language Association.

Nursing: The baccalaureate and master's programs of the College of Nursing are accredited by the Arizona State Board of Nursing and the National League for Nursing. The continuing education program is accredited by the Western Regional Accrediting Committee of the American Nurses' Association as a provider of Continuing Education for Nursing. The college is a member of the Council of Member Agencies for the Baccalaureate and Higher Degree Programs of the National League for Nursing, and the Western Council on Higher Education for Nursing.

Public Programs: American Council on Education in Journalism and Mass Communication, 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 160,000). 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 subtropical landscaping characterize a campus serving the physical, aesthetic, and educational needs of students, faculty, and staff.

ASU Research Park. The mission of the research park is to attract new research and development firms to Tempe who will conduct joint research with ASU departments, interact with graduate students, consult with university faculty, co-sponsor high-level speakers and seminars on research topics and provide employment opportunity for graduates of ASU. Long-term excess revenues from ground leases within this 323 acre park will flow back to the ASU Foundation to be used for support of existing and new research programs at ASU. Currently, the park has several major tenants (ICI America, VLSI and National Association of Purchasing Management) plus a 50,000 square foot speculative building developed by Transamerica Corporation. The park is also working with a developer to build a modern conference and service facility within the center of the park. The research park is part of ASU's effort to become a major research university by attracting high-quality private and public research firms and institutes.

ASU West Campus. ASU West Campus is an upper-division branch of Arizona State University located in northwest Phoenix to serve the higher educational needs of residents of western Maricopa County. Construction of the permanent campus was begun in 1986 on a 300-acre site bounded by Thunderbird and Sweetwater Roads and 43rd and 51st Avenues in Phoenix. The first building, the library, is expected to be in use by the spring of 1988.

Completion of the first phase of the campus, capable of serving 10,000 students, is expected in the 1990s. While the new campus is under construction, classes and services are offered at three facilities: ASU West Alhambra, ASU West Montebello and the American Graduate School of International Management. See pages 416-418 for further information.

Arizona State University Computer Institute. The Arizona State University Computer Institute located at 3883 E. Thomas Road in Phoenix, Arizona, represents a new approach in providing computer education. The first of its kind in the United States, the Institute offers a wide variety of microcomputer training classes.

The Computer Institute offers introductory to advanced level classes from computer awareness, programming, information management, graphics, business applications, word processing, education, technical and special applications. The institute also works closely with business and industry to provide tailored classes developed specifically for a client and his or her employees.

For additional information, contact the ASU Computer Institute.

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.

Downtown Center. Located at 410 North 7th Street in Phoenix, ASU's convenient Center is in one of the former Phoenix Union High School buildings. Courses of interest to the business community are offered during evening hours. Information about all ASU curricula and programs are available from the Center.

University Libraries and Collections

The collections of the university's libraries comprise more than 2.2 million volumes, approximately 2.5 million microform units and more than 31,000 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. ASU is a member of the Association of Research Libraries and the Center for Research Libraries.

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.

Specialized collections include comprehensive holdings of the Pre-Raphaelite period, a 14th-century manuscript on algebra, the child drama collection, the Thomas Mosher collection, and the William S. Burroughs collection.

A 97,000 square foot underground addition is scheduled for completion in February 1989.

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.

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

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. This major branch library houses books, journals, and microforms in the sciences and geography, the Solar Energy Collection, the Map Collection, and the U.S. Patent Collection.

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

University Media Systems. This facility provides non-print media resources selected to enhance instruction and research. Television services support the development, acquisition, production, scheduling and delivery of courses. Audio, photography and graphics production services are also available. Audiovisual equipment can be scheduled for use by faculty, staff and students. Educational films and videotapes can be obtained for classroom use from a variety of sources.

Cultural Arts Resources

Gammage Center for the Performing Arts. 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 Museum. This large complex of galleries and art study rooms is housed in Matthews Center. The Oliver B. James Collection of American Art ranges from the early 18th century to the contemporary and includes major works by Stuart, Ryder, Homer, and the Ash Can School painters. Master works by great printmakers such as Dürer, Rembrandt, Whistler and Hogarth are often featured in special exhibitions culled from ASU's extensive print collections.

The gallery devoted to Latin American art features folk art as well as paintings by celebrated 20th century artists Rivera, Siqueiros and Tamayo. Throughout the museum fine examples of 19th and 20th century crafts are interspersed with painting and sculpture.

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.

Computing Facilities and Services

Computing Services (CS) provides a variety of equipment and services at no charge to meet the needs of the faculty, staff and students of Arizona State University.

CS operates eight computing sites distributed throughout the campus. In many sites both terminals and microcomputers are available. These microcomputers are connected to local area networks providing easy access to shared data, software, printers and plotters. The mainframe and minicomputers can also be accessed by phone, so faculty, staff and students can work from home or office with their own terminal or microcomputer.

A variety of educational services, and instructional and research consulting are available to help faculty and students. Consulting is also available for faculty, staff, and students who have or plan to buy their own microcomputer.

COMPASS (the Computing Assistance Center) provides documentation, news publications, manuals, handbooks, "how-to" guides and other information concerning CS systems and software.

CS provides the following computing facilities to the academic community:

Microcomputers. CS operates over 350 IBM and IBM-compatible and over 50 Apple Macintosh microcomputers. The microcomputers are provided with software including word processors, spreadsheets, databases, programming languages, graphics and other applications.

IBM 3090. The IBM 3090 mainframe runs the batch-oriented MVS operating system. The IBM 3090 features several programming languages, statistical packages and graphics.

IBM 4381. The IBM 4381 runs the interactive CMS operating system. Software includes programming languages, statistical packages and graphics.

VAX 8600. The VAX 8600 runs the interactive VMS operating system. Software includes several text editors and a wide variety of programming languages including several for artificial intelligence, graphics and other applications.

Undergraduate Enrollment: Policies and Procedures

Arizona State University shares with other colleges and universities a tradition of service and academic excellence that is hundreds of years old. Its purpose is the exchange of knowledge and the pursuit of wisdom. What makes this university special is its commitment to provide a setting where faculty and students are challenged to exchange ideas and information within an atmosphere of intellectual honesty.

The university offers its students unique opportunities to enjoy both a rich cultural heritage and a diverse student population. All persons giving evidence of suitable preparation–usually by way of acceptable academic credentials–are welcome to the university without regard to race, skin color, religious creed or national origin.

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.

Remaining in good standing in the university community is a privilege rather than a right. A student, by enrolling, voluntarily assumes certain obligations of conduct and performance. These conduct expectations include avoiding irresponsible use of alcohol and the use, possession, distribution, or possession with intent of distribution of illegal drugs. The university enforces its conduct rules through sanctions imposed for violations. The university also cooperates fully with law enforcement agencies to enforce all laws relating to alcohol use and illegal substances.

Educational programs are available to students regarding alcohol and illegal drug use through the Student Health Center. Students are encouraged to use the health information resource clinic in the Health Center to obtain information about alcohol, illegal drugs or other health-related issues.

The university has a strong educational interest in its students' conduct. Students are expected, as part of their obligations of enrollment, to become familiar with the university *Code of Conduct*. Violations of this *Code* are subject to university discipline, whether committed by individuals or groups. This is also true of violations of university regulations with regard to academic dishonesty. The university reserves the right to take necessary and appropriate action to protect the safety and welfare of the campus community. Such action may include taking disciplinary measures under the *Code of Conduct* against students whose behavior off campus indicates that they pose a danger to others.

Student Services at ASU

Arizona State University is a richly diverse academic setting enrolling more than 42,000 students. The ASU student may be a traditional 18 to 24 year old, a recent high school graduate, a community college transfer, an adult returning to college to pursue a degree while having commitments at home and work, or the professional studying for an advanced degree or career change. The ASU student lives in residence halls or sororities or fraternities on campus, or commutes from one of the many communities in metropolitan Phoenix. Each of the 50 states, and more than 100 foreign countries, have students enrolled on this campus.

The campus is organized into six distinct administrative areas. Student Affairs, one of the six areas, is responsible for the delivery of a variety of services and developmental programs in support of students' total university needs and educational pursuits. These programs and services are based upon human development research which advocates that a person develops physically, psychologically, morally,

socially, spiritually, emotionally, culturally and intellectually. Student Affairs services are accomplished through effective environmental management and purposeful program planning.

Special attention is given not only to the recruitment of a high achieving, culturally diverse student body, but to the creation of an energetic campus ecology that both catalyzes mature development and advances the academic endeavors of students.

Enrollment services to students are begun through recruitment, admissions, student financial assistance, on-campus housing and registration programs. Once students are on campus they are encouraged to explore the structural facilities, the service offerings and human resources available. Campus agencies guiding students in this learning process include Counseling and Consultation, Student Life, Educational Development, Student Health, Student Publications, Residence Life and the Memorial Union. Each of these areas provides specialized learning opportunities which contribute to an environment that fosters both personal and academic growth.

ASU's commitment to students does not diminish as a student nears graduation. By promoting career exploration and placement services, students are accompanied through their transition from the university experience to the professional lifestyles and challenges they have chosen to pursue.

Degree Programs Currently Offered at ASU

Programs Leading to the Bachelor's Degree

Accountancy
Administrative Services
Aeronautical Engineering Technology
Aeronautical Management Technology
Aerospace Engineering
Agribusiness
Anthropology
Architectural Studies
Art
Asian Languages (Chinese/Japanese)
Bioengineering
Biology
Botany
Broadcasting
Chemical Engineering
Chemistry
Choral (Music) - General
Civil Engineering
Clinical Laboratory Sciences
Communication
Communication Arts
Computer Engineering Technology
Computer Information Systems
Computer Science
Construction
Dance
Design Science
Early Childhood Education
Economics
Electrical Engineering
Electronics Engineering Technology
Elementary Education
Energy Systems Engineering
Engineering Science
Engineering Technology
English
Environmental Resources in Agriculture
Family Resources and Human Development
Finance
French
General Business
General Sciences
Geography
Geology
German
History
Housing and Urban Development
Humanities
Industrial Design
Industrial Engineering
Industrial Vocational Education
Industrial Technology
Instrumental Music
Interdisciplinary Programs (Engineering)
Interdisciplinary Studies
Interior Design
Italian
Journalism
Justice Studies
Management
Manufacturing Engineering Technology
Marketing
Materials Science
Mathematics
Mechanical Engineering
Medical Technology
Microbiology
Microelectronics Engineering Management
Music
Music Therapy
Nursing
Operations/Production Management
Performance (Music)
Philosophy
Physical Education
Physics
Political Science
Psychology
Purchasing/Materials Management
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
Building Design
Business Administration
Chemical Engineering
Chemistry
Child Drama
Choral Music
Civil Engineering
Communication
Communication Disorders
Community Education
Computer Science
Counseling
Counselor Education
Creative Writing
Dance
Decision and Information Systems
Economics
Educational Administration and Supervision
Educational Media
Educational Psychology
Educational Technology
Electrical Engineering
Elementary Education
Engineering Science
English
Environmental Resources in Agriculture
Environmental Planning
Family Resources and Human Development
French
Geography
Geology
German
Health Services Administration
Higher and Adult Education
History
Humanities
Industrial Engineering
Instrumental Music
Justice Studies
Laws
Mass Communication
Mathematics
Mechanical Engineering
Microbiology
Music History and Literature
Natural Science
Nursing
Performance (Music)
Philosophy
Physical Education
Physics
Political Science
Public Administration
Recreation
Religious Studies
School Library Science
Secondary Education
Social and Philosophical Foundations (Education)
Social Work
Sociology
Spanish
Special Education
Taxation
Technology
Theatre
Theory and Composition (Music)
Zoology

Program Leading to the Education Specialist Degree

Educational Administration and Supervision

Programs Leading to the Doctoral Degree

Anthropology
Botany
Business Administration
Chemical Engineering
Chemistry
Choral Music
Civil Engineering
Computer Science
Counseling Psychology
Counselor Education
Curriculum and Instruction
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
Justice Studies
Law
Mathematics
Mechanical Engineering
Microbiology
Physics
Political Science
Psychology
Public Administration
Science and Engineering of Materials
Secondary Education
Social Work
Sociology
Solo Performance
Spanish
Special Education
Zoology

Fees, Deposits and Other Charges

The following fees 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. Always refer to the current semester *Schedule of Classes* for the up-to-date fee amounts.

Academic Year Registration and Tuition

Full-time Students. Students registered for seven 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 19. Registration and Tuition fees are:

In-State status	$639.00
Out-of-State status:	
12 hours and over	$2,433.00
11 hours	$2,283.00
10 hours	$2,134.00
9 hours	$1,984.00
8 hours	$1,835.00
7 hours	$1,685.00

Part-Time Students

Students registered for 6 hours or less .. $67 per hour

Concurrent Enrollment; Nonresident Tuition.

A. It is unlawful for any nonresident student to register concurrently in two or more public institutions of higher education in this state including any university or community college for a combined student credit hour enrollment of more than six semester hours without payment of nonresident tuition at one of such institutions.

B. Any nonresident student desiring to enroll concurrently in two or more public institutions of higher education in this state including any university or community college for a combined total of more than six semester hours who is not subject to nonresident tuition at any of such institutions shall pay the nonresident tuition at the institution of his choice in an amount equivalent to nonresident tuition at such institution for the combined total of semester hours for which the nonresident student is concurrently enrolled. (A.R.S. Ch.14, par.15-1807)

Summer Sessions, Off-Campus Academic Services and Correspondence

Fees are:

Summer Sessions	$67 per hour
Academic Services	$63 per hour
Correspondence	$33 per hour
Law Courses	$85 per hour

Further information on these services is included in the sections on Summer Sessions (pages 427-428) and Off-Campus Academic Services, Correspondence (pages 431-433).

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

1/2 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

Fee assessed on registrations beginning with the first day of each session	$10.00

Admission Application $25.00

This is a non-refundable fee paid by undergraduate applicants residing outside the State of Arizona.

Transcripts for Currently Enrolled Students $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 additional pages cost $1 per each five pages copied.

Graduation Application or Reapplication:

Undergraduate	$10.00
Graduate	$15.00

If the graduation charge is not paid on or before the date specified in the section of this *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.

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

Paid by all students seeking to establish credit by examination.

Parking Decals ..... Varies

A parking decal must be purchased for motor vehicles parked on campus. Annual decals run from $37.00 for perimeter parking to $90.00 for controlled access parking.

Effective August 15, 1988, when obtaining an ASU parking decal, it will be necessary to submit verification that each vehicle being registered is in compliance with State of Arizona emission's standards. This verification can be accomplished by providing:

1. A copy of the current vehicle registration, if the vehicle is registered in Maricopa or Pima county, or
2. A copy of the emissions test result obtained from a state authorized emission's testing facility, if the vehicle is registered in another Arizona county or state. The fee for this emission's inspection is $7.50 per vehicle.

If you have any questions regarding this policy or parking at ASU, please call 602/965-7275 for assistance.

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.

Returned Checks and Credit Cards. Checks or credit card payments 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 or credit card payment is not repaid within this five day period. Repayment of a returned check or credit card must typically be in cash.

Students paying registration and tuition with a check or credit card that is subsequently not honored by a bank 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 "Campus Ecology–Residence Life."

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 fee payment deadline is printed on all Schedule/Billing Statements. Fees must be paid by the date and time indicated or the registration will be voided.

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 35th calendar day	No refund

Withdrawal occurs on the calendar day that a complete 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%
3rd day of session	60%
4th day of session	40%
5th day of session	20%
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 emer-

gency 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:

Rents and Deposits. Housing rents and deposits are refunded as prescribed by the Residence Life license agreement that students sign when they apply for residence hall accommodations. Students should refer to this document for specific information on refunds.

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, a complete withdrawal form must be submitted to one of the Registrar Sites during operating hours on the workday preceding the weekend or holiday. Refunds are normally paid by check and mailed to the student's local address

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

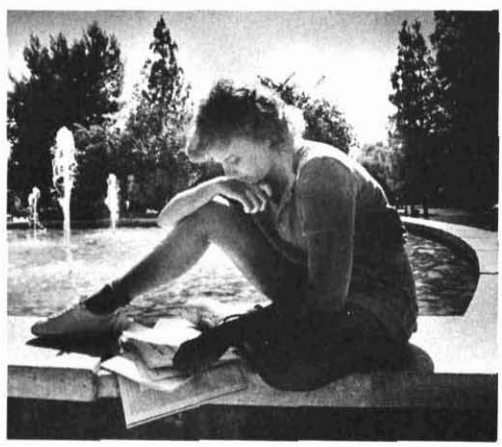
Board of Regents' Policy 4-103B states:

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. Procedures to be followed for disputed charges are available from the Accounts Receivable Section of the Business Services Office.

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, Tempe, AZ 85287-1105 or call 602/965-7712.



STUDENT BUDGETS FOR 1988-89

Cost/Allowance Category	On-Campus	Living w/ Parents	Off-Campus
Room/Board	$ 3,520	$ 1,500	$ 4,000
Personal (Including Travel)	$ 1,980	$ 1,900	$ 2,200
Living Total	$ 5,500	$ 3,400	$ 6,200
Fees	$ 1,278	$ 1,278	$ 1,278
Books/Supplies (15-hour course load)	$ 450	$ 450	$ 450
In-State Total	$ 7,228	$ 5,128	$ 7,928
Tuition	$ 3,588	$ 3,588	$ 3,588
Out-of-State Total	$ 10,816	$ 8,716	$ 11,516

Note:

1. Living expenses (room, board, personal expenses) are stated for a nine-month period. Limited financial assistance is available for the summer session.
2. Tuition and fees are subject to change without notice.
3. 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 are intended to assist a student in satisfying this budget.

Financial Aid

The primary responsibility for financing a college education belongs to students and their families. The Student Financial Assistance Office will assist students in meeting this responsibility by evaluating all aid applications through the use of a standard financial needs analysis system to determine the cost of their education, as well as how much students and their families can afford to contribute toward that cost. It is the students' responsibility to complete all applications in an accurate and timely manner and to notify the Student Financial Assistance Office of any changes in circumstances that might affect eligibility (i.e., 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, state and federal governments.

To be considered for financial aid all students must complete an application separate from the admission application. The College Scholarship Service Financial Aid Form is the preferred application, although the American College Testing Family Financial Statement is also acceptable. Either form should be completed between January and March preceding the academic year the student anticipates attending ASU. Students will be notified by mail regarding any additional items needed to complete their applications. 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 their expenses and contribution for the school year and will specify the amount of the applicant's financial need. If students have financial need in excess of $200, they will receive a separate Financial Aid Notification. This letter will inform them of the types and amounts of aid they are are eligible to receive through ASU. Applicants should read carefully all correspondence received from the Student Financial Assistance Office.

Students receiving aid from the Student Financial Assistance Office 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 semester 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. Undergraduate students are eligible to receive financial assistance for the equivalent of six full-time years.

Types of Financial Aid

Please refer to publications of the Student Financial Assistance Office for detailed information concerning the following programs:

Scholarships
- University funded
- Privately sponsored

Grants
- Pell Grant
- Supplemental Educational Opportunity Grant (SEOG)
- State Student Incentive Grant (SSIG)
- University Grant

Loans
- Perkins Loan (NDSL)
- Guaranteed Student Loan (GSL)
- Parent Loan for Undergraduate Students (PLUS)
- Supplemental Loans for Students (SLS)
- Short Term Loans

Employment
- College Work Study Program (CWSP)
- University hourly
- Part-time off-campus

Undergraduate Admission

Arizona State University welcomes application for admission from all persons seeking benefit from the university's broad spectrum of educational programs and services.

Prospective students may call 965-7788 (toll free numbers 1-800-252-ASU1 for out-of-state applicants and 1-800-325-9371 for in-state) or write to the Undergraduate Admissions Office for information including application materials. With reasonable advance notice, the Undergraduate Admissions Office will arrange for a tour of the campus and, if desired, a meeting with an admissions counselor.

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 academic advisement, placement testing, campus tours, special events and an introduction to university resources and procedures. Parent programs are also included. Newly admitted students will be sent information preceding each orientation program. Students are strongly encouraged to attend orientation activities.

Admission 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 Undergraduate Admissions Office:

1. Application for Admission (including Domicile Affidavit);
2. Official transcript(s);
3. American College Test (ACT), Scholastic Aptitude Test (SAT) or Test of English as a Foreign Language (TOEFL) scores (as needed); and
4. The $25 application fee (for applicants residing outside the State of Arizona only).

Applicants are urged to apply and have their materials sent 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. After all necessary items are received, 4 to 6 weeks should be allowed for an admission decision to be made.

Priority Deadline

Arizona Applicants. The priority deadline for receipt of undergraduate admission materials is 45 days prior to the first day of classes.

Non-resident Applicants. The priority deadline for receipt of undergraduate materials is April 15 for fall semester and December 15 for spring semester.

Applicants whose files are not complete by the priority deadline may not be admitted in time to register for the desired semester. Admitted students who do not register must submit a new application if they wish to apply for a subsequent semester. All documents are destroyed one year after applied semester if the student is not registered in a degree program.

Any misrepresentation or falsification, including failure to report any college or university attendance, is cause for cancellation of enrollment and any credits earned.

Application. Prospective students must complete and sign the Application for Undergraduate Admission. A $25 nonrefundable fee is required of all applicants residing outside the State of Arizona.

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. Residents of Arizona are required to file a Domicile Affidavit which is part of the admission application. Any student who does not complete the Domicile Affidavit will be classified an out-of-state resident for tuition purposes. Students should contact the Residency Classification Office, or call 602/965-7712 for more information.

Transcripts. Transcripts must be requested by the applicant. Official transcripts of academic records from high school, as well as a separate transcript from each institution of higher education the student has attended, must be *mailed directly* to the Undergraduate Admissions Office by the records office of the issuing institution(s). *Transcripts sent 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. Applicants with less than 36 semester hours of transferable college or university credit must also have official high school records submitted. An English translation of all transcripts is required.

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

completed less than 36 semester hours of acceptable college or university work must submit either ACT or SAT scores. ACT and SAT scores are used to complete competency requirements and for course placement.

A report of the test scores must be sent to the Undergraduate 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.

All applicants whose native language is not English, and who have not attended a high school in the United States for their junior and senior years, or graduated from a United States college or university, are required to take the Test of English as a Foreign Language (TOEFL) in place of the ACT or SAT. A minimum score of 500 is required. Applicants to the School of Engineering, Department of Computer Science and the Division of Construction must score a minimum of 550 to be admitted into the Professional Engineering curricula.

The Undergraduate Admissions office may investigate any test score which is inconsistent with a student's academic record or previous scores.

Health History Questionnaire. Every newly admitted student must complete the Arizona State University Health History Questionnaire and must provide a complete immunization history for Student Health. A tuberculin skin test is recommended for international students who come from a high risk environment. Students will not be permitted to register until the immunization history is on file with Student Health. 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

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 satisfactory scholarship defined as follows:

Both general aptitude and basic competency requirements must be met.

GENERAL APTITUDE REQUIREMENTS

Freshmen

Class Rank	Composite Score ACT		SAT		GPA (4.00 = A)
Arizona residents					
Top Half	or	21	or	930	or 2.50 high school GPA
Non-residents*					
Top Quarter	or	23	or	1010	or 3.00 high school GPA

* All freshmen who believe they have had a strong high school background and who rank in the top half of their graduating classes or who have a minimum GPA of 2.50 on a 4.00 = A scale are encouraged to apply and will be strongly considered on a case-by-case basis.

Based on the review, the applicants may be admitted unconditionally, admitted with conditions, deferred until additional course work is completed or denied.

College Transfers

Transferable Semester Hours	GPA (4.00 = A)	Materials Required
Arizona residents		
1-35	2.00 college GPA plus freshman requirements	Application, college and high school transcripts, and ACT or SAT scores
36 or more	2.00 college GPA	Application and college transcripts

Non-residents*				
See above		2.50 college GPA		See above

* All transfers who have earned a 2.00-2.49 cumulative GPA are encouraged to apply and will be strongly considered on a case-by-case basis.

Based on the review, the applicants may be admitted unconditionally, admitted with conditions, deferred until additional course work is completed, or denied.

BASIC COMPETENCY REQUIREMENTS

May be met by combinations of high school courses, college courses and test scores. Transfer students with 36 or more transferable semester hours with a 2.00 GPA, and students 22 years of age or older at time of enrollment, need only meet the general aptitude requirements described above.

(An applicant whose most recent education is outside the United States is exempt from fulfilling the competency requirements.)

English				
Four years high school English Composition/Literature based	OR	Minimum test score ACT English - 19 or SAT Verbal - 450	OR	Three semester hours (one course) transferable college-level English Composition
Mathematics				
Three years high school: One year Algebra I One year Geometry I One year requiring Algebra I as a prerequisite	OR	Minimum test score ACT Math - 18 or SAT Math - 500	OR	Two transferable three semester hour college-level Pre-algebra courses or one transferable three semester hour College Algebra course
Laboratory Science				
Two years high school, one each from two of the following: Biology Chemistry Earth Science Physics	OR	One year high school lab science (Biology, Chemistry, Earth Science, Physics) plus minimum test score on one of the following: ATP Chemistry Achievement - 575 ATP Biology Achievement - 550 ATP Physics Achievement - 590 ACT Natural Science - 20 Test score may not be from same subject as high school credit earned	OR	Two transferable four semester hour college lab science courses in different subject areas
Social Science - complete both A and B				
A One year high school American History	OR	Minimum test score on ATP American History/Social Studies Achievement - 510	OR	One transferable three semester hour college American History course
B One year high school social science (e.g., European History, World History, Sociology, Geography, Government, Anthropology)	OR	Minimum score on one of the following: ATP European History/World Cultures Achievement - 545 ACT Social Studies - 18	OR	One transferable three semester hour college social science course

NOTE:

1. A minimum 2.00 average (4.00 = A) must be earned in the courses taken in each of the 4 competency areas.
2. Applicants with a maximum of 1 deficiency in no more than 2 competency areas may gain regular admission subject to removing the deficiencies within one calendar year of university enrollment.
3. Competencies may be met by combinations of high school and college courses or test scores.

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, Arizona State University, Tempe, AZ 85287-0705. 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. An upward grade trend during the high school career, or an upward grade trend during the senior year.

2. Positive recommendations from secondary school administrators, faculty or counselors based on considerations such as: academic potential, work experience, leadership ability or extracurricular activities.
3. An average score of 50 or greater on the General Education Development (GED).
4. 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 semester hours at a community college or summer or evening sessions at a university, or both.

The School of Engineering recommends 2½ 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 Liberal Arts and Sciences strongly recommends a minimum of two years of a single foreign language.

The College of Nursing requires one year each of high school physics and chemistry. Two years of high school chemistry are recommended.

Admission Prior to Graduation from High School. 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. 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. In addition, students who were admitted with more than two deficiencies must submit, at least 45 days in advance of the semester, official records to verify the completion of competencies such that *no more than* two deficiencies remain. Students with more than two deficiencies who have not been admitted 45 days in advance of the semester may not be eligible for admission. The admission may be cancelled if the final verification shows that the applicant has not met the university requirements for admission or that more than two deficiencies remain.

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. High school seniors who rank in the top 10% of their class or students who have already completed all the available course work in a specific academic area, 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 Undergraduate 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 class standing and rank must be sent directly to the Undergraduate Admissions Office by the high school.
3. Students not in the top 10% must have the principal or counselor of the high school send a written recommendation to the Undergraduate Admissions Office authorizing the enrollment of the high school student at Arizona State University at the same time the student is completing the high school program.

Admission of Unclassified Applicants–Undergraduate. Any high school graduate is invited to enroll for six semester hours or less per semester of undergraduate course work as an unclassified student. Students admitted as unclassified for a specific year and term must remain as unclassified until the next semester.

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. 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.

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

Transfer Applicants

Arizona Applicants. An Arizona applicant for transfer admission must have a cumulative grade point average of 2.00 or higher (see specific college requirements listed in Arizona transfer applicant section above) on a 4.00 = A scale in all work undertaken at previous institutions of higher learning. A minimum of 12 college or university transferable semester hours must have been earned in order to be considered a transfer applicant.

Arizona transfer applicants to the following areas must have the respective minimum grade point average: Computer Science–2.75; Engineering–2.50; Construction–2.25; Technology–2.25; Speech and Hearing Science–2.50; Education–2.50.

Non-Resident Applicants. A non-Arizona applicant for transfer admission must have a cumulative grade point average of 2.50 or higher (see specific college requirements) on a 4.00 = A scale in all work undertaken at previous institutions of higher learning. Those applicants who have at least a 2.00 on a 4.00 = A scale and believe they have a strong academic record are encouraged to apply and will be considered on a case-by-case basis.

Applicants with less than 36 semester hours of completed transferable college or university work must submit official high school records and meet Basic Competency requirements. Students who will be 22 years old by the time the semester begins are exempt from the competency requirements.

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 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 post-secondary institutions for life experience;
3. Credits awarded by post- secondary 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.

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 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 Community Colleges. 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 68.)

Admission Prior to Receipt of Final Transcript. Students enrolled in other colleges and universities will be considered for 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. *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 will be denied admission. Such applicants, however, may write a letter of appeal accompanied by letters of recommendation, to the University Undergraduate Admissions Board, Arizona State University, Tempe, AZ 85287-0705, for reconsideration of their applications. The decision of this Board is final.

Admission of Disabled Applicants

Persons with disabilities who meet academic qualifications are encouraged to apply for admission to Arizona State University.

A pre-admission inquiry may be made by 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. Refusal to respond to the inquiry or to provide information requested will have no bearing on either the applicant's admission or treatment at Arizona State University.

Disabled Student Resources is staffed with specially trained professionals working with hearing impaired/deaf, visually impaired/blind, orthopedically disabled, learning disabled and other handicapped applicants. Disabled Student Resources is committed to facilitating appropriate resources which will allow each qualified disabled student access to a greater number of educational, social and cultural/recreational opportunities within the university community. Each student is encouraged to function independently and to develop his/her own techniques for attaining the highest possible goals in life.

Disabled Student Resources coordinates a comprehensive academic support program for the disabled student population. (For additional information about available services see page 71.) Eligibility for such services is based on enrollment, appropriate documentation of permanent or temporary disability and documented need for academic support services.

Students with disabilities who require attendant care or other personal assistance must make appropriate arrangements *before the beginning of each academic term.* The student has the sole responsibility for his/her own personal care assistance.

To ensure a smooth transition into the university community, prospective students with disabilities are encouraged to contact the Disabled Student Resources, Arizona State University, Tempe, AZ 85287-2204, or call 602/965-1234 (TTY).

Undergraduate Applicants who will Attend on F-1 or J-1 Visas

To comply with Immigration and Naturalization Services regulations, students who will attend Arizona State University on an F-1 or J-1 visa are required to:

1. Submit a financial statement assuring adequate resources to support themselves while in residence at the university.
2. 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.
3. Pay a nonrefundable application fee of $25 in U.S. funds.
4. Meet all appropriate immigration standards and requirements.

Upon admission to the university, such students are issued a Certificate of Eligibility (Form I-20 or IAP-66) which enables them to apply for the appropriate visa.

All F-1 or J-1 visa students must 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.

Upon arrival on campus, students must report to the International Student Advisor in the Student Life Office.

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 85287-3106. Acceptance into the American Language and Culture Program is separate from admission to the university. For additional information see pages 429-430.

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. No credit will be given for any examination with a score of 2 or 1.

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

Exam	Score	Semester Hours
Art-History	5 or 4	6 (ARS 101 and 102)
	3	3 (ARS 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	9 (BIO 181 and 182)
	3	4 (BIO 181)
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 (Virgil, Lyric, Prose)		Department will evaluate examination and recommend
French, German or Spanish–Language	5	14 FRE 201, 205, 311, 312 GER 201, 202, 311, 312 SPA 201, 202, 311, 312
	4	11 FRE 201, 205, 311 GER 201, 202, 311 SPA 201, 202, 311
	3	8 FRE 201, 205 GER 201, 202 SPA 201, 202
French, German or Spanish–Literature	5	18 FRE 111, 201, 205, 321, 322 15 GER 111, 201, 202, 314 15 SPA 111, 201, 202, 325
	4	12 FRE 111, 201, 205 GER 111, 201, 202 SPA 111, 201, 202
	3	8 FRE 201, 205 GER 201, 202 SPA 201, 202
History-American or European	5 or 4	6 (HIS 103 and 104 or 101 and 102)
	3	Department will evaluate examination and recommend

Exam	Score	Semester Hours
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	
Political Science		
American Government and Politics	5 or 4	3 (POS 110)
	3	Department will evaluate examination and recommend
Comparative Government and Politics	5 or 4	3 (POS 150)
	3	Department will evaluate examination and recommend
Computer Science	5	6 (CSC 100 and CSC 101)
	4	3 (CSC 100; additional credit to be recommended by the department.)
	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 with Essay on which students must receive a standard score of 610/1978 scale or 500/1986 scale. *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	Semester Hours	Equivalency
English Composition	None	With essay exempts ENG 101 and 102 to enter ENG 105
Humanities	6	General Studies Credit
Mathematics	3	MAT 106
Natural Sciences	8	General Studies or Major Credit
Social Science	6	Elective Credit

Subject Examinations	Semester Hours	Equivalency
Accounting	3	ACC 212
American Government	3	POS 310*
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
Business Law	3	Elective Credit
Calculus	4	MAT 270
Clinical Chemistry	None**	Petition Microbiology Department if transfer from an Arizona community college
College Algebra	3	MAT 117
College Algebra and Trigonometry	4	MAT 115
College Composition	None	With satisfactory essay exempts ENG 101 and 102 to enter ENG 105
College French	8	FRE 101 and 102
College German	8	GER 101 and 102
College Spanish	8	SPA 101 and 102
Computers and Data Processing	3	Elective Only
Educational Psychology	3	EDP 310*
English Literature	3	General Studies (Seniors may use ENG 221 or 222)
Fortran IV	3	CSC 183

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

Subject Examinations	Semester Hours	Equivalency
Freshman English	None	Recommend College Composition Subject Exam
General Chemistry	9	CHM 113 and 115
General Psychology	3	PGS 100
Hematology	None**	Petition 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 Law	3	Elective
Introduction to Business Management	None	No Credit
Introduction to Calculus	4 3	Introduction to Marketing Elective (No credit if major is in College of Business)
Introduction to Sociology	3	SOC 101
Macroeconomic Principles	3	ECN 111 (Dept. will accept credit for 111 or 112–not both)
Microeconomic Principles	3	ECN 112 (No credit or advanced placement if major is Economics or any major in College of Business)
Microbiology	4	MIC 205 and 206
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)	None	Not acceptable toward BS in Nursing.

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

Subject Examinations	Semester Hours	Equivalency
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 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. 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 decision on the suitability of course material for a comprehensive examination, the development of a comprehensive examination and the administration of an examination are strictly departmental functions. 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 chair of the department responsible for offering the course.

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. New students (also continuing, reentry and transfer students who have not taken any composition courses) are placed in First-Year Composition courses according to their scores on the ACT English or SAT Verbal test. Students who score 16 or below on the ACT English test or 380 or below on the SAT Verbal test must enroll in ENG 071, a noncredit basic writing course. Students who score between 17 and 24 on the ACT English test or between 390 and 580 on the SAT Verbal test are eligible to enroll in ENG 101. Students who score 25 or higher on the ACT English test or 590 or higher on the SAT Verbal test may take ENG 105 in place of ENG 101 or 102. Students who are accepted in the Honors Program are eligible to enroll after being advised in ENG 105. Students may also qualify for ENG 105 by achieving appropriate scores on the CLEP General Examination in English Composition with Essay or the CLEP Subject Examination in College Composition with Essay.

Foreign Language. For information regarding foreign language placement, see page 111 (Foreign Languages) and page 28 (Advanced Placement).

Mathematics. All students registering for 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.

Academic Advisement

Effective academic advisement of students is an essential aspect of the educational experience at Arizona State University. Faculty, staff and administrators share a commitment to provide quality academic advisement to students. To assure swift and sound advisement to their majors, each college has advisors to assist students in developing programs of study; assessing educational alternatives; examining academic goals; and understanding rules, procedures and curriculum requirements. Advisement is one of each faculty member's responsibilities; and faculty are evaluated, in part, on the quality of their work as advisors.

An additional unit, the University Academic Advising Center, is a central advising, referral and information facility ready to assist students in their academic careers at Arizona State University. The center provides special advising services to prospective, undecided, undeclared, unclassified and visiting students. Information is available at the center concerning program standards; general studies and graduation requirements; tutoring and other support services; probation, disqualification and retention procedures; transferring between colleges; as well as times and places for various forms of general testing (including Mathematics and English placement and aptitude testing).

Students are strongly encouraged to seek academic advisement at the earliest possible time and regularly throughout their programs of study at ASU. Academic offices may be contacted at:

University Academic Advising Center
Social Science 101 (965-4464)
Hours: M-TH 8:00 - 6:30
F 7:00 - 4:00
Sat. 9:00 - 12:00

College of Architecture and Environmental Design
Architecture 16 (965-3584)
Hours: M-F 8:00 - 12:00
1:00 - 5:00

College of Business
Business Administration (West) 140 (965-4227)
Hours: M-F 8:00 - 5:00

College of Education
Payne Education B7 (965-3877)
Hours: M-F 8:00 - 5:00

College of Engineering and Applied Sciences
Engineering Center G 115 (965-5150)
Hours: M-F 8:00 - 5:00

College of Fine Arts
Gammage Hall 127 (965-6647)
Hours: M-F 8:00 - 12:00
1:00 - 5:00

Graduate College
Wilson Hall Lobby (965-3521)
Hours: M-Th 10:00 - 7:00
F 10:00 - 2:00

College of Law
Law 102 (965-7207)
Hours: M-F 8:00 - 5:00

College of Liberal Arts and Sciences
Social Science 111 (965-6506)
Hours: M-F 8:00 - 5:00

College of Nursing
Nursing 108 (965-2987)
Hours: M-F 8:00 - 5:00

College of Public Programs
Wilson 203 (965-1058)
Hours: M-F 8:00 - 12:00
1:00 - 5:00

School of Social Work
West Hall 137 (965-6081)
Hours: M-F 8:00 - 12:00
1:00 - 5:00

ASU West Campus
Student Services, Alhambra (965-5555/279-5485)
Call for appointment

Registration

All persons attending a class at Arizona State University 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 has been admitted or readmitted to the university (see Admissions, pages 22 and 67).

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 ID's are issued throughout the semester at the Payne Registration Site (Ed-B 42). (Refer to page 17 for replacement fee.)

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 published 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 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, in correspondence courses or in 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 the maximum course load, prior permission must be granted by the college standards committee. (See Course Loads, above.)

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

Enrollment Verification Guidelines. The following general guidelines are used only 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 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

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.

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 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 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 Student Financial Assistance of students approved for co-op terms.

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.

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, Family Resources and Human Development).

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 and Environmental Design, 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.

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 and Sciences 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 and Sciences. 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 and Sciences.

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 Sciences, and the fall and spring Women's Studies brochure.

Classification of Courses

Information about courses appears in two places, the *General Catalog*, published annually, 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 Catalog* or page 424.)

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 specialization 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 and Sciences. 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.

International Program Courses. Courses with the prefix IPO numbered 495 and 595 are reserved for the international study abroad program. Undergraduates may receive credit for 12-18 semester hours, graduates for 6-12.

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.

Omnibus Courses. 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		*Semester Hours*
484	Undergraduate Internship	1-12
500	Special Courses for Research Methods	1-12
580	Practicum	1-12
583	Field Work	1-12
584	Internship	1-12
590	Reading and Conference	1-12
591	Seminar	1-12
592	Research	1-12
593	Applied Project	1-12
594	Conference and Workshop	1-12
598	Special Topics	1-4
600	Research Methods	1-12
680	Practicum	1-12
683	Field Work	1-12
684	Internship	1-12
690	Reading and Conference	1-12
691	Seminar	1-12
692	Research	1-12
693	Applied Project	1-12
700	Research Methods	1-12
780	Practicum	1-12
783	Field Work	1-12
784	Internship	1-12
790	Reading and Conference	1-12
791	Seminar	1-12
792	Research	1-15
799	Dissertation	1-15

The above are set forth in announcements of the Graduate College and are also available in the respective departments, where offered. Under special circumstances, arrangements may be made at the dean's request, through the approval of the vice president for Academic Affairs, to increase the standard semester hours of credit.

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 semester hours
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'88, S'89 ..... Course offered every other year on semester indicated
N ..... Course not regularly offered
† ..... Further prerequisites

Student Records

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 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.

Grading System

Scholarship Grades and Marks. All grades and marks will appear on the grade report and/or the permanent record.

They are indicated by the following letters:

A - Excellent (4.00)	NR - No Report
B - Good (3.00)	P - Pass
C - Average (2.00)	RC - Remedial Credit
D - Passing (1.00)	RN - Remedial No Credit
E - Failure (0.00)	W - Withdrawal
I - Incomplete	X - Audit
Y - Satisfactory	

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" (unrestricted withdrawal) may be recorded. This grading option may not be changed after the close of drop-add. The "X" is not included in earned hours and is not computed in the grade point average.

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. "P" is included in earned hours, but is not computed in the grade point average.

Remedial Enrollment. A mark of "RC" (remedial credit) or "RN" (remedial no credit) may be assigned for this grading option. The course appears on the grade report, but is not recorded on the official transcript nor included in earned hours.

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" should be 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. The student has one calendar year from the date the mark of "I" is recorded to complete the course. If the student completes the course within the calendar year, the instructor must submit a change of grade form to the Registrar's Office, whether the student passed or failed the course. Marks of "I" will be changed to a grade of "E" for purposes of evaluating graduation requirements. 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." A student does not re-register or pay fees for a course for which an incomplete "I" has been received in order to complete the course.

Drop/Add. A student who has registered for courses for a semester or summer session may drop or add courses through the first week of classes or the first two days of a summer session. See the *Schedule of Classes* or *Summer Sessions Bulletin* for dates of the drop/add period. During this period a student may drop one or more (but not all) scheduled courses without penalty. Courses that are dropped do not appear on the student's transcript and fees paid are fully refunded, depending on the student's remaining hours. A student who wishes to withdraw from all courses during the drop/add period must process an unrestricted withdrawal.

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.*

The number of restricted withdrawals with the mark of "W" is limited: During freshman standing, a total of 3; during sophomore standing, a total of 2; during junior and senior standing, a total of 2; during second undergraduate degree standing, a total of 2. The preceding limits do not prevent students from processing a complete withdrawal from the university with marks of "W" and/or "E." Complete withdrawal counts as one withdrawal for purposes of applying the above limits. The preceding does not apply to audit enrollment.

Instructor Initiated Withdrawal. 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. Restricted withdrawal limits do not apply to withdrawals initiated by an instructor.

Withdrawal from the University. In order to withdraw from *all* classes after having paid registration fees, a student must initiate complete withdrawal from the university by appearing in person or by addressing a signed request to the Office of the Registrar. 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 in the *Summer Session Bulletin.* The date of the complete withdrawal is always the date the withdrawal form or letter is received in the Office of the Registrar.

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 525.)

Repeating Courses. An undergraduate course taken at ASU may be repeated for credit if the grade of "D" or "E" or "W" or a mark of "X" is received. 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. Students who have graduated will not be eligible to delete the grade for a course which was taken prior to the award of the ASU Bachelor's degree. 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.

This policy does not apply to seminar and independent study courses with different content each semester. This policy affects only undergraduate students and undergraduate courses.

Mid-Term Deficiency Report. Instructors are required to evaluate students at mid-term for academic deficiencies. A student who has been evaluated for a "D" or "E" at mid-semester will receive a deficiency 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 enforce a "Financial 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) an official or unofficial transcript will not be issued; (2) registration privileges will be suspended; (3) 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 dates of attendance. No transcript will be issued in case of a "Financial 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, any Registrar Site, or by mail if a signed release 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. For information on parental access to records, reference Access to Records, page 38.

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, 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 Student Financial Assistance Office or the Veterans Affairs Office respectively. Students should contact their advisors or the appropriate office for additional information on satisfactory progress requirements.

Student Academic Complaints. If a student is dissatisfied with the instruction received in a class or with the interaction with the instructor of the class, the student may pursue the following avenues in the order listed:

1. Discuss the complaint with the instructor of the class. If the issue is not resolved at this level, the student may
2. Contact the chair of the department in which the course is offered. If further discussion/appeal is needed, the student may
3. Contact the dean of the college in which the course is offered.

Dean's List. Undergraduate students who earn 12 or more graded semester 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 **only** 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 student who is disqualified may not attend as an unclassified student.

Reinstatement.

1. If a student with a GPA of 2.00 or greater has been disqualified by one college and seeks to transfer to another college at ASU, the student may apply at the Readmissions Office (Student Services Building, Lobby 113) or directly to the college to which the student wishes and is qualified to transfer.
2. To be reinstated into an ASU college different from the disqualifying college, the student must submit an application for reinstatement to the University Undergraduate Admissions Board.
3. To be reinstated into the same college from which the student was disqualified, the student must submit an application for reinstatement to the disqualifying college.

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 prerogative 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 a minimum of twelve additional semester hours in residence at ASU, may, upon petition to the dean of the college, have former record treated in the same manner as transfer credits. Credit will be granted for up to 64 hours in courses in which a grade of "C" or better was earned. The original cumulative grade point average will be listed separately rather than included as part of the ASU grade point average. 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.

The University General Studies Requirement

The General Studies program is based on four principles. The first is the distinction between skill and knowledge–the instrumental skills by means of which knowledge is acquired and communicated, and the knowledge itself in the sense of fact, information or conclusions. Second is the distinction between skill in the use of language and skill in the use of figures–literacy and numeracy. Third is the conventional division of knowledge into the humanities, the social sciences and the natural sciences. And fourth is the concept of the university graduate as a person who is not only prepared for advanced study or a particular profession, but also is amply prepared to lead a constructive and satisfying personal, social and civic or political life. This principle implies a commonality of knowledge (that is, knowledge shared with others), skill in learning and in communicating with others, and a diversity of learning which frees the person to enjoy the diversity of human potentiality. In addition to the four principles, the program recognizes the value of sustained experience in the acquisition of a skill or the mastery of a body of knowledge, the increasing importance of literacy and numeracy skills because of the rapid growth of modern knowledge, the utility of historical perspective, and the internationalization of modern life.

The General Studies program consists of **five "core" areas and two "awareness" areas. The core areas are:**

Literacy and Critical Inquiry
Numeracy
Humanities and Fine Arts
Social and Behavioral Sciences
Natural Sciences

These areas provide training in basic academic skills and assure that students are introduced to the traditional branches of knowledge. **The two awareness areas are:**

Global Awareness
Historical Awareness

These contribute to the development of an international perspective and foster an understanding of current human events by study of the past.

The courses approved by the university General Studies Council for meeting General Studies requirements are noted in the *General Catalog* following this section, the course descriptions and in the *Schedule of Classes* each academic term. All students enrolled in a baccalaureate degree program must successfully complete a minimum of 35 semester hours of approved General Studies courses. The required distribution of General Studies courses among the core areas and awareness areas is described below. It is important to note that **35 semester hours must be taken in the five core areas. Fulfillment of the requirements in global awareness and historical awareness does not oblige the student to exceed the 35 semester-hour total since a large number of approved courses within the five core areas concurrently satisfy the global or the historical requirement as well.**

Although a course may satisfy a core area requirement and an awareness area requirement concurrently, **a course may not be used to satisfy requirements in two different core areas simultaneously or in both the awareness areas,** even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirements and the major program of study. 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.

Specific patterns of General Studies requirements are established by the colleges within the overall program. First-Year Composition is a university requirement of all students that is separate from and in addition to the General Studies program.

Core Areas

1. Literacy and Critical Inquiry

Literacy is here defined broadly as communicative competence in written and oral discourse. Critical inquiry involves the gathering, interpretation and evaluation of evidence. Any field of university study may require unique critical skills which have little to do with language in the usual sense (words), but the use of spoken and written evidence pervades university study and everyday life. The General Studies requirements assume that all undergraduates should develop the ability to reason critically and communicate using the medium of language.

The requirement in literacy and critical inquiry presumes, first, that training in literacy and critical inquiry must be sustained beyond traditional First-Year Composition in order to create a habitual skill in every student; and, second, that the skills become more expert, as well as more secure, as the student learns to read, hear, analyze, and write or speak using increasingly challenging subject matter. *Thus, the literacy and critical inquiry requirement stipulates a sequence of two courses beyond First-Year Composition.*

Requirement (6 semester hours):

(1) **One course at the intermediate level** (typically at the sophomore level) devoted primarily to development of skill in reading, writing, listening, speaking or critical analysis of discourse; this course includes a series of formal, graded, written or spoken assignments in composing critical discourse.

(2) **One upper-division course** with advanced subject-matter and rigorous critical-writing assignments in a specialized discipline. This course can be taken in the student's major discipline and count toward the major's semester-hour requirements.

2. Numeracy

Numeracy includes not only an understanding of the basic tenets of mathematics, but also statistical procedures and concepts and the ability to assimilate and interpret quantitative data. It also includes the use of computer software in facilitating analytical thinking. Fundamental to the development of numeracy skills at the university level are the principles and practices taught in courses widely known as College Algebra. These courses are designed to develop the minimal level of mathematical ability required for an understanding of the sciences, statistical methods and quantitative analysis. In addition, algebraic logic offers one of the simplest approaches to the development of a rational process of thinking and reasoning in daily life. Contemporary developments in computer hardware and software have substantially enhanced the application of mathematical and statistical models to a wide variety of physical and social situations.

Requirement (6 semester hours):

One course must be selected from the mathematics category; a second course must be selected from either of the remaining two categories listed below. However, if competence is demonstrated in College Algebra by passing an exemption examination, six semester hours are still required, and one course in the mathematics category that has College Algebra as a prerequisite may be selected, or all six semester hours may be taken in one or both of the two remaining categories.

(1) **Mathematics:** A course in College Algebra (i.e., MAT 115 or 117) or any other mathematics course for which College Algebra is a prerequisite.

(2) **Statistics and Quantitative Reasoning:** Courses that emphasize the use of statistics or other mathematical methods in the interpretation of data and in describing and understanding quantitative relationships. The course selected can be taken in the student's major discipline and count toward the major's semester-hour requirements.

(3) **Computer Applications:** Courses that involve the use of computer programming languages or software in the development of skills in analytical thinking. The course selected can be taken in the student's major discipline and count toward the major's semester-hour requirements.

3. Humanities and Fine Arts

The humanities are concerned with questions of human existence and the universality of human life, questions of meaning and the nature of thinking and knowing, and questions of moral, aesthetic and other human values. The humanities investigate these questions in both the present and the past and make use of philosophy, foreign languages, linguistics and communication studies, religious studies, literature and fine arts. The fine arts constitute the artist's creative deliberation about reality, meaning, knowledge and values. The humanities and fine arts core area enables students to broaden and deepen their consideration of basic human values and their interpretation of the experiences of human beings.

Requirements (6-9 semester hours):

A total of 15 semester hours must be completed in the following two core areas: humanities and fine arts and social and behavioral sciences. A minimum of 6 semester hours must be taken in one core area and 9 hours in the other core area. In addition, three conditions must be satisfied:

(1) In one of these two core areas, two courses must be in the same department; and

(2) In one of these two core areas, courses from at least two departments must be taken. These two conditions may, but need not, be satisfied in the same core area.

(3) At least one course within the 15 semester hours must be at the upper-division level.

4. Social and Behavioral Sciences

The social and behavioral sciences provide scientific methods of inquiry and empirical knowledge about human behavior, both within society and individually. The forms of study may be cultural, economic, geographic, historical, linguistic, political, psychological or social. The courses in this area address the challenge of understanding the diverse natures of individuals and cultural groups who live together in a world of diminishing economic, linguistic, military, political and social distance.

Requirement (6-9 semester hours):

A total of 15 semester hours must be completed in the following two core areas: social and behavioral sciences and humanities and fine arts. A minimum of 6 semester hours must be taken in one core area and 9 hours in the other core area. In addition, three conditions must be satisfied:

(1) In one of these two core areas, two courses must be in the same department; and

(2) In one of these two core areas, courses from at least two departments must be taken. These two conditions may, but need not, be satisfied in the same core area.

(3) At least one course within the 15 semester hours must be at the upper-division level.

5. Natural Sciences

Courses in the natural sciences core area help the student to develop an appreciation of the scope and limitations of scientific capability, of the potential for uncertainty in the results of scientific inquiry, of the time required to conduct such inquiries, of their cost in terms of human and financial resources, and of the risks involved. Above all, however, the courses stress mastery of basic scientific principles and concepts, in particular those that relate to matter and energy in living and non-living systems and a knowledge of the methods of scientific inquiry. Because the concepts, principles and even the vocabulary of science may be meaningless in an introductory course without firsthand exposure to scientific phenomena, laboratory work is required. The natural sciences core area requires at least one laboratory course that includes a substantial introduction to the fundamental behavior of matter and energy in physical or biological systems. This requirement derives from the fact that the natural sciences trace all physical and biological phenomena to fundamental principles governing the behavior of matter and energy. These principles have proven to be of value in reliably predicting and rationalizing a broad range of phenomena in the natural sciences and in other fields as well.

Requirements (8 semester hours):

(1) **One laboratory course in the natural sciences** that includes a *substantial* introduction to the fundamental behavior of matter and energy in physical or biological systems.

(2) **A second laboratory course in the natural sciences** selected, for example, from astronomy, botany, chemistry, experimental psychology, geology, microbiology, physical anthropology, physical geography, physics or zoology.

Awareness Areas

1. Global Awareness

Human organizations and relationships have evolved from being family- and village-centered to the modern global interdependence which is apparent in many disciplines–for example, contemporary art, business, engineering, music, and the natural and social sciences. Many serious local and national problems are world issues and require solutions which exhibit mutuality and reciprocity. These problems occur in a wide variety of activities such as food supply, ecology, health care delivery, language planning, information exchange, economic and social developments, law, technology transfer, and even philosophy and the arts. The global awareness area recognizes the need for an understanding of the values, elements and social processes of cultures other than the culture of the United States. The global awareness area includes courses which recognize the nature of other contemporary cultures and the relationship of the American cultural system to generic human goals and welfare.

Courses which meet the requirement in global awareness are of one or more of the following types: (1) area studies which are concerned with an examination of culture-specific elements of a region of the world; (2) the study of foreign language; (3) studies of international relationships, particularly those in which cultural change is facilitated by such factors as social and economic development, education, and the transfer of technology; and (4) studies of cultural interrelationships of global scope such as the global interdependence produced by problems of world ecology.

Requirement: One of the approved courses in the global awareness course list, either in the group of courses which simultaneously satisfy a core area requirement or in the group of courses which satisfy

the global awareness requirement only. Courses which are listed for a core area and global awareness may satisfy both requirements concurrently.

2. Historical Awareness

The historical awareness area aims to develop a knowledge of the past which can be useful in shaping the present and future. Because historical forces and traditions have created modern life and lie just beneath its surface, historical awareness is an aid in the analysis of present-day problems. Also, because the historical past is a source of social and national identity, historical study can produce intercultural understanding by tracing cultural differences to their origins in the past. Even the remote past may have instructive analogies for the present.

The historical awareness area consists of courses which are historical in method and content. In this area the term "history" designates a sequence of past events or a narrative whose intent or effect is to represent such a sequence. The requirement presumes that these are human events and that history includes all that has been felt, thought, imagined, said, and done by human beings. History is present in the languages, art, music, literature, philosophy, religion and the natural sciences, as well as in the social science traditionally called History.

Requirement: One of the approved courses in the historical awareness list, either in the group of courses which simultaneously satisfy a core area requirement or in the group of courses which satisfy the historical awareness requirement only. Historical awareness courses which are also listed for a core area concurrently satisfy both requirements.

The following General Studies courses satisfy the requirements of the five core areas and two awareness areas. Under each core and awareness area courses are presented alphabetically by:

1. College name,
2. Course prefix, followed by course number and course title. The number in parentheses following the course title indicates the semester hours of credit. The letter following the semester hours of credit indicates when the course will be offered:

F ..... Course offered fall only
S ..... Course offered spring only
SS1, SS2 ..... Course offered first (1) or second (2) summer session only
F, S ..... Course offered both semesters
A ..... Course offered once a year
F'88, S'89 ..... Course offered every other year on semester indicated
N ..... Course not regularly offered

General Studies courses are regularly reviewed. The following key to General Studies credit abbreviations identifies which requirement(s) the course meets. This key also will be used in the *Schedule of Classes*. General Studies courses are also identified following course descriptions.

Key to General Studies Credit Abbreviations

L1	Literacy and Critical Inquiry Core Courses (Intermediate level)
L2	Literacy and Critical Inquiry Core Courses (Upper division)
N1	Numeracy Core Courses (Mathematics)
N2	Numeracy Core Courses (Statistics and Quantitative Reasoning)
N3	Numeracy Core Courses (Computer Applications)
HU	Humanities and Fine Arts Core Courses
SB	Social and Behavioral Science Core Courses
S1	Natural Science Core Courses (Introductory)
S2	Natural Science Core Courses (Additional Courses)
G	Global Awareness Courses
H	Historical Awareness Courses

Literacy and Critical Inquiry Core Courses, Intermediate Level (L1)

COLLEGE OF BUSINESS

GNB 233 Business Communication. (3) F, S, SS

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

CHE 351 Measurements Laboratory. (2) F
352 Transport Laboratories. (2) S
(Both must be taken to secure L1 credit)

COLLEGE OF FINE ARTS

DAH 301 Philosophy and Criticism of Dance. (3) F, S

COLLEGE OF LIBERAL ARTS AND SCIENCES

ENG 200 Critical Reading and Writing About Literature. (3) F, S
211 Advanced Composition. (3) F, S
212 English Prose Style. (3) N
301 Writing for the Professions. (3) F, S

LIA 171H **The Human Event.** (3) F, S
172H **The Human Event.** (3) F, S
PHI 103 **Principles of Sound Reasoning.** (3) F, S, SS
PSY 290 **Experimental Psychology.** (4) F, S
REL 210 **Introduction to Judaism.** (3) A
294 **The Magic of Magic.** (3) A

COLLEGE OF PUBLIC PROGRAMS

COM 207 **Introduction to Communication Inquiry.** (3) F, S, SS
222 **Argumentation.** (3) A
225 **Public Speaking.** (3) F, S, SS
241 **Introduction to Oral Interpretation.** (3) F, S, SS

Literacy and Critical Inquiry Core Courses, Upper Division (L2)

COLLEGE OF ARCHITECTURE

ANP 431 **Architectural Programming Methods.** (3) S

COLLEGE OF BUSINESS

MGT 463 **Business Policies.** (3) F, S, SS

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

BME 413 **Physiological Instrumentation.** (3) S
CHE 413 **Physiological Instrumentation.** (3) S
ECE 400 **Engineering Communications.** (3) F, S, SS
MET 460 **Manufacturing Capstone Project.** (3) S
TCE 400 **Technical Communications.** (3) F, S, SS

COLLEGE OF FINE ARTS

ARA 488 **Understanding Art.** (3) F, S
MUE 381 **Music Therapy Research.** (3) S
MHL 439 **Music in the 19th Century.** (3) N
441 **Music of the Baroque Era.** (3) N
447 **Music Since 1900.** (3) F, SS

COLLEGE OF LIBERAL ARTS AND SCIENCES

ASB 333 **New World Prehistory.** (3) S
412 **History of Anthropology.** (3) F
ASM 455 **Primate Behavior Laboratory.** (3) N
ENG 358 **Afro-American Literature.** (3) N
400 **History of Literary Criticism.** (3) S
419 **English Literature in the Early Seventeenth Century.** (3) S
425 **Romantic Poetry.** (3) F
426 **Victorian Poetry.** (3) S
427 **Age of Johnson.** (3) S
428 **Age of Dryden, Swift, and Pope.** (3) F
430 **19th Century British Cultural Backgrounds.** (3) N
439 **Drama from Dryden to Sheridan.** (3) S '90
441 **20th Century American Drama.** (3) N
451 **The Novel to Jane Austen.** (3) F
452 **The 19th Century Novel.** (3) S
453 **The American Novel to 1900.** (3) F
458 **American Novel Since 1945.** (3) S
FRE 321 **French Literature.** (3) F
322 **French Literature.** (3) S
471 **The Literature of Francophone Africa and the Caribbean.** (3) F
JPN 321 **Japanese Literature.** (3) N
MIC 302 **Advanced Bacteriology Laboratory.** (2) F
494 **Research Paper.** (1) F, S, SS
POS 498 **Pro-Seminar.** (3) A
REL 305 **Ritual, Symbol, and Myth.** (3) A
315 **Hebrew Bible (Old Testament).** (3) A
330 **Native American Religious Traditions.** (3) A
331 **History of Native American Religious Traditions.** (3) N
340 **Confucianism and Taoism.** (3) A
350 **Hinduism.** (3) A
381 **Religion and Moral Issues.** (3) A
385 **Contemporary Religious Thought.** (3) A
390 **Women and Religion.** (3) A
454 **Hindu Religious Thought.** (3) A
RUS 321 **Survey of Russian Literature.** (3) F, S
322 **Survey of Russian Literature.** (3) F, S
323 **Survey of Soviet Literature.** (3) F, S
420 **Russian Poetry.** (3) N
421 **Pushkin.** (3) N
423 **Dostoyevsky.** (3) N
424 **Tolstoy.** (3) N
425 **Chekhov.** (3) N
426 **Soviet Dissident Literature (1917-Present).** (3) N
430 **Russian Short Story.** (3) N
SOC 410 **Sociology of Religion.** (3) S
453 **Social Class and Stratification.** (3) S
454 **The Afro-American in Modern Society.** (3) S
462 **Social Control.** (3) F
464 **Women's Roles.** (3) S
SPA 424 **Masterpieces of Hispanic Literature.** (3) S
WST 498 **Pro-Seminar: Theoretical Issues in Women's Studies.** (3) A

COLLEGE OF NURSING

NUR 403 **Research in Nursing Practice.** (3) F, S

COLLEGE OF PUBLIC PROGRAMS

COM 308 **Empirical Research Methods in Communication.** (3) F, S
321 **Rhetorical Theory and Research.** (3) F, S

JUS 463 **Discretionary Justice.** (3) F, S, SS

NOTE: The undergraduate honors thesis (493) (3 semester hours) also fulfills the L2 requirement.

Numeracy Core Courses, Mathematics (N1)

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

AET 472 **Applied Linear Analysis.** (3) N

COLLEGE OF LIBERAL ARTS AND SCIENCES

MAT 115 **College Algebra and Trigonometry.** (4) F, S, SS
117 **College Algebra.** (3) F, S, SS
118 **Plane Trigonometry.** (2) F, S, SS
119 **Finite Mathematics.** (3) F, SS
210 **Brief Calculus.** (3) F, S, SS
219 **Mathematical Structures.** (3) S
242 **Elementary Linear Algebra.** (2) F, S, SS
260 **Technical Calculus I.** (3) F, S, SS
270 **Calculus with Analytic Geometry I.** (4) F, S, SS1
290 **Calculus I.** (5) F, S

Numeracy Core Courses, Statistics and Quantitative Reasoning (N2)

COLLEGE OF BUSINESS

ECN 480 **Introduction To Econometrics.** (3) A
485 **Mathematical Economics.** (3) A
QBA 221 **Statistical Analysis.** (3) F, S, SS
222 **Introduction to Management Science.** (3) N

COLLEGE OF EDUCATION

EDP 454 **Introduction to Descriptive Data Analysis and Measurement.** (1-3) F, S, SS

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

AET 490 **Mathematical Modeling of Aerospace Systems.** (2) S
ASE 485 **Engineering Statistics.** (3) F, S, SS
ECE 383 **Probability and Statistics for Engineers.** (2) F, S, SS
ERA 350 **Applied Quantitative Methods.** (3) F
IEE 476 **Operations Research Techniques/ Applications.** (4) F, S

COLLEGE OF LIBERAL ARTS AND SCIENCES

BIO 415 **Biometry.** (4) F
HIS 382 **Historical Statistics.** (3) A
MAT 419 **Linear Programming.** (3) S
451 **Mathematical Modeling.** (3) A
POS 401 **Political Statistics.** (3) F, S
PSY 230 **Introduction to Statistics.** (3) F, S, SS
330 **Statistical Methods.** (3) S
SOC 390 **Social Statistics I.** (3) F, S, SS
433 **Demography.** (3) S
STP 226 **Elements of Statistics.** (3) F, S, SS
326 **Intermediate Probability.** (3) F, S
420 **Introductory Applied Statistics.** (3) F, S

COLLEGE OF PUBLIC PROGRAMS

COM 308 **Empirical Research Methods in Communication.** (3) F, S
408 **Quantitative Methods in Communication Research.** (3) N
JUS 302 **Basic Statistical Analysis in Justice Studies.** (3) F, S, SS

Numeracy Core Courses, Computer Applications (N3)

COLLEGE OF BUSINESS

CIS 200 **Computers in Business.** (3) F, S

COLLEGE OF EDUCATION

CBE 421 **Computer Literacy.** (3) F, S, SS

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

CEE 400 **Microcomputer Applications in Civil Engineering.** (3) F, S
CHE 461 **Process Control.** (3) F
CON 389 **Construction Cost Accounting and Control.** (3) F, S

	495	Construction Planning and Scheduling. (3) F, S
CSC	101	Introduction to Computer Science II. (3) F, S
	180	Computer Literacy. (3) F, S
	181	Applied Problem Solving with BASIC. (3) F, S
	183	Applied Problem Solving with Fortran. (3) F, S
	300	Concepts of Computer Science. (4) A
	355	Introduction to Theoretical Computer Science. (3) F, S
	410	Information Processing. (3) A
	412	Database Management. (3) S
	420	Comparison of Computer Architectures. (3) A
	428	Computer-Aided Processes. (3) A
	450	Analysis of Algorithms. (3) F
	457	Theory of Formal Languages. (3) A
	470	Computer Graphics. (3) S
	473	Non-Procedural Programming Languages. (3) S
	474	Modeling for Computer Simulation. (3) A
	475	Simulation Theory and Languages. (3) A
ECE	106	Introduction to Computer-Aided Engineering. (3) F, S
EEE	221	Digital Computer Fundamentals. (4) F, S, SS
ICG	310	Computer Graphics Fundamentals. (3) A
	312	Computer Assisted Graphics. (3) A
	412	Computer Graphics Modeling. (3) A
IEE	330	Microcomputer Applications in Industrial Engineering. (3) F, S
	463	Computer-Aided Manufacturing and Control. (3) F, S
	464	Computer-Integrated Design. (3) F, S
	475	Introduction to Simulation. (3) F, S
MAE	405	Microcomputer-Aided Processes for MAE. (3) F, S
MET	416	Applied Computer Integrated Manufacturing. (3) S
TCE	250	Digital Systems and Microprocessors. (3) F, S

COLLEGE OF FINE ARTS

ART	444	Computer Art I. (3) F, S

COLLEGE OF LIBERAL ARTS AND SCIENCES

ASM	494	Roles in Computer Anthropology. (3) S
BIO	420	Computer Applications in Biology. (3) F
MAT	464	Numerical Analysis I. (3) F
	465	Numerical Analysis II. (3) S
	466	Applied Computational Methods. (3) F, S
	467	Computer Arithmetic. (3) S
STP	429	Experimental Statistics. (3) S

Humanities and Fine Arts Core Courses (HU)

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN

APH	100	Introduction to Environmental Design I. (2) F, S
	101	Introduction to Environmental Design II. (2) F, S
	304	American Architecture. (3) N
	305	Contemporary Architecture. (3) N
	311	Survey of Mexican Architecture. (2) N
	313	History of Western Architecture I. (3)F
	348	Theory of Built Environments. (3) N
	441	Ancient Architecture. (3) N
	443	Renaissance Architecture. (3) N
	444	Baroque Architecture. (3) N
	445	19th Century Architecture. (3) N
	446	20th Century Architecture I. (3) F
	447	20th Century Architecture II. (3) S
DSC	100	Contemporary International Design. (3) F, S
	216	History of Interior Design I. (3) F
	223	Introduction to Interior Design. (2) S
	316	20th Century Design I. (3) F
	317	20th Century Design II. (3) S
	318	Decorative Arts/Cultural Influences. (3) F
	494	History of Graphic Design. (3) A
PUP	100	Introducton to Environmental Design I. (2) F, S
	101	Introduction to Environmental Design II.(2) F, S
	320	Theory of Built Environments. (3) N

COLLEGE OF EDUCATION

HUE	101	Ideas and Values in the Humanities. (4) F, S
	102	Ideas and Values in the Humanities. (4) F, S
	130	Introduction to Popular Culture. (3) F, S

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

STE	201	Technology and Social Change. (2) A
	310	Man and Machine. (2) A
	311	Science and Technology in History. (3) F
	312	Science and Technology in History. (3) S
	402	Technology, Society and Human Values. (3) A

COLLEGE OF FINE ARTS

ARA	488	Understanding Art. (3) F, S

ARS 100 **Introduction to Art.** (3) F, S, SS
101 **Art of the Western World I.** (3) F, S
102 **Art of the Western World II.** (3) F, S
201 **Art of the Non-Western World I.** (3) A
202 **Art of the Non-Western World II.** (3) A
300 **Introduction to Art.** (3) F, S
325 **History of Christian Art.** (3) N
400 **History of Printmaking.** (3) A
402 **Ancient Near Eastern Art.** (3) N
404 **Greek Art.** (3) A
406 **Roman Art.** (3) A
410 **Early Christian and Byzantine Art.** (3) A
412 **Early Medieval Art.** (3) A
414 **Romanesque Art.** (3) A
416 **Gothic Art.** (3) A
418 **Renaissance Art in Northern Europe.** (3) A
420 **Early Renaissance Art in Italy.** (3) A
422 **Italian High Renaissance Art and Mannerism.** (3) A
424 **Italian Baroque Art.** (3) A
426 **Art of the 17th Century in Northern Europe.** (3) A
428 **Art of the 18th Century.** (3) A
430 **Art of Spain and Its Colonies.** (3) A
432 **Art and Revolution.** (3) A
434 **Romanticism and Realism.** (3) A
436 **Impressionism and Late 19th Century Art.** (3) A
438 **Art of the 20th Century I.** (3) A
439 **Art of the 20th Century II.** (3) A
450 **19th Century Photography.** (3) A
451 **20th Century Photography.** (3) A
454 **Research and Writing in Photography.** (3) A
456 **History of Art Criticism I.** (3) N
457 **History of Art Criticism II.** (3) N
458 **20th Century Art Criticism.** (3) N
459 **Writing Art Criticism.** (3) N
462 **Pre-Columbian Art I.** (3) A
463 **Pre-Columbian Art II.** (3) A
465 **North American Indian Art.** (3) A
466 **Southwest Indian Art.** (3) A
468 **Shamanism and Art.** (3) A
469 **Mexican Art.** (3) A
472 **Art of China.** (3) A
473 **Art of Japan.** (3) A
475 **Chinese Painting.** (3) A
480 **Research Methods.** (3) F, S

DAH 100 **Introduction to Dance.** (3) F, S
300 **Introduction to Dance.** (3) F, S
301 **Philosophy and Criticism of Dance.** (3) F, S
401 **Dance History I.** (3) F
402 **Dance History II.** (3) S

MHL 466 **North American Indian Music.** (3) N

MUS 107 **Introduction To Music.** (2) F, S, SS
340 **Survey of Music History.** (3) F, S, SS
347 **Jazz in America.** (3) F, S, SS
353 **Survey of Afro-American Music.** (3) A
354 **Popular Music.** (3) A
355 **Survey of American Music.** (2) F, S, SS
356 **Survey of the Musical Theatre.** (3) N
357 **Aesthetic Perception in Music Performance.** (3) F, S, SS

THE 100 **Introduction to Theatre.** (3) F, S
300 **Film: The Creative Process.** (3) F, S, SS
320 **History of the Theatre.** (3) F, S
321 **History of the Theatre.** (3) F, S
325 **Play Reading.** (1) F, S, SS
400 **Focus on Film.** (1) F, S, SS
420 **History of the American Theatre.** (3) S
421 **History of the English Theatre.** (3) F

COLLEGE OF LIBERAL ARTS AND SCIENCES

ASB 222 **Buried Cities and Lost Tribes: Our Human Heritage.** (3) S

ENG 110 **Introduction to Literature.** (3) F, S
200 **Critical Reading and Writing About Literature.** (3) F, S
201 **World Literature.** (3) F
202 **World Literature.** (3) S
204 **Literature of Today.** (3) F, S
221 **Survey of English Literature.** (3) F, S
222 **Survey of English Literature.** (3) F, S
260 **Film Analysis.** (3) N
303 **Classical Backgrounds of English Literature.** (3) F
307 **Utopian Literature.** (3) N
312 **English In Its Social Setting.** (3) F, S
314 **Modern Grammar.** (3) F, S
321 **Introduction to Shakespeare.** (3) F, S
341 **American Literature.** (3) F, S
342 **American Literature.** (3) F, S
352 **Short Story.** (3) F, S
355 **History of the Drama.** (3) S
356 **Biblical Backgrounds of Literature.** (3) F, S
357 **Introduction to Folklore.** (3) N
358 **Afro-American Literature.** (3) N
359 **American Indian Literatures.** (3) S
360 **History of Film.** (4) N
361 **Silent Film.** (4) F
362 **Sound Film Genres.** (4) S
400 **History of Literary Criticism.** (3) S
413 **History of the English Language.** (3) F, S
415 **Medieval Literature.** (3) F
418 **Renaissance Literature.** (3) F
419 **English Literature in the Early Seventeenth Century.** (3) S
420 **Renaissance Drama.** (3) S
421 **Shakespeare I.** (3) F, S

422 **Shakespeare II.** (3) F, S
423 **Milton.** (3) F, S
424 **Chaucer.** (3) F, S
425 **Romantic Poetry.** (3) F
426 **Victorian Poetry.** (3) S
427 **Age of Johnson.** (3) S
428 **Age of Dryden, Swift, and Pope.** (3) F
430 **19th Century British Cultural Backgrounds.** (3) N
435 **19th Century American Poetry.** (3) F
439 **Drama from Dryden to Sheridan.** (3) S '90
440 **American Literature to 1815.** (3) N
441 **20th Century American Drama.** (3) N
443 **American Poetry, 1900-1945.** (3) F
444 **American Romanticism, 1830-60.** (3) F
445 **American Realism, 1860-1900.** (3) S
448 **20th Century British Novel.** (3) S
451 **The Novel to Jane Austen.** (3) F
452 **The 19th Century Novel.** (3) S
453 **The American Novel to 1900.** (3) F
454 **The American Novel, 1900-1945.** (3) F
457 **American Poetry Since 1945.** (3) S
458 **American Novel Since 1945.** (3) S
460 **Western American Literature.** (3) S
461 **Women and Literature.** (3) N
463 **European Drama from Ibsen to 1914.** (3) N
464 **European Drama from 1914 to the Present.** (3) N
471 **Literature for Adolescents.** (3) F, S

FLA 150 **Introduction to East Asian Culture.** (3) S
323 **Survey of Soviet Literature in Translation.** (3) F, S
400 **Linguistics.** (3) S
420 **Foreign Literature in Translation.** (3) F, S

FRE 205 **Intermediate Reading.** (4) F, S
321 **French Literature.** (3) F, S
322 **French Literature.** (3) F, S
415 **French Civilization.** (3) S
441 **French Literature of the 17th Century.** (3) F
442 **French Literature of the 17th Century.** (3) S
445 **French Literature of the 18th Century.** (3) F
452 **French Novel of the 19th Century.**(3) S
461 **Pre-Atomic Literature.** (3) F
462 **Post-Atomic Literature.** (3) S
471 **The Literature of Francophone Africa and the Caribbean.** (3) F

GER 311 **German Conversation.** (3) F, S
312 **German Conversation.** (3) F, S
313 **German Composition.** (3) S
321 **German Literature.** (3) F, S
322 **German Literature.** (3) F, S
411 **Advanced Grammar and Conversation.** (3) F
412 **Advanced Grammar and Composition.** (3) S
415 **German Civilization.** (3) F, S

GRK 301 **Greek Literature.** (3) F
302 **Greek Literature.** (3) S

HIS 333 **Women and Society in Europe.** (3) N
365 **Islamic Civilization.** (3) F

HPS 201 **Technology and Social Change.** (2) A
321 **Man and Machine.** (2) A
322 **Science and Technology in History.** (3) F, S
323 **Science and Technology in History.** (3) F, S
402 **Technology, Society and Human Values.** (3) A

HUM 110 **Contemporary Issues in Humanities.** (3) F
301 **Humanities in the Western World.** (4) F, S
302 **Humanities in the Western World.** (4) F, S
413 **Comedy: Meaning and Form.** (3) S
414 **Tragedy: Meaning and Form.** (3) A

ITA 314 **Advanced Italian.** (3) N
325 **Introduction to Italian Literature.** (3) F
415 **Italian Civilization.** (3) N
430 **Italian Literature of the Middle Ages.** (3) N
441 **Dante: *Divina Commedia.*** (3) N
443 **Italian Literature of the Renaissance.** (3) N
446 **Italian Literature of the 18th and 19th Century.** (3) N
449 **20th Century Italian Literature.** (3) N

LAT 201 **Intermediate Latin.** (4) F, S
202 **Intermediate Latin.** (4) F, S

LIA 171H **The Human Event.** (3) F, S
172H **The Human Event.** (3) F, S

PHI 101 **Introduction to Philosophy.** (3) F, S, SS
103 **Principles of Sound Reasoning.** (3) F, S, SS
111 **Introduction to Moral and Social Philosophy.** (3) F, S, SS
301 **History of Ancient Philosophy.** (3) F
302 **History of Modern Philosophy.** (3) S
303 **Contemporary Analytic Philosophy.** (3) A
304 **Existentialism and Phenomenology.** (3) A
305 **Ethics.** (3) A
306 **Applied Ethics.** (3) A
307 **Philosophy of Law.** (3) A
308 **Philosophy of Art.** (3) A
309 **Social and Political Philosophy.** (3) A
311 **Philosophy in Literature.** (3) A
312 **Theory of Knowledge.** (3) A
314 **Philosophy of Science.** (3) A
315 **Philosophy of Language.** (3) A
316 **Metaphysics.** (3) A
317 **Philosophy of Mind.** (3) A

318 Philosophy of Religion. (3) A
325 Philosophy of Social Science. (3) N
332 19th Century Philosophy. (3) N
401 Rationalism. (3) N
402 Empiricism. (3) N

POR 313 Portuguese Composition and Conversation. (3) F, S
314 Portuguese Composition and Conversation. (3) F, S
321 Luso-Brazilian Literature. (3) N
472 Luso-Brazilian Civilization. (3) N

POS 440 History of Political Philosophy I. (3) A
441 History of Political Philosophy II. (3) A
442 American Political Thought. (3) A
443 Topics in Contemporary Political Theory. (3) A
446 Problems of Democracy. (3) A

REL 100 Religions of the World. (3) F, S
210 Introduction to Judaism. (3) A
270 Introduction to Christianity. (3) A
305 Ritual, Symbol, and Myth. (3) A
315 Hebrew Bible (Old Testament). (3) A
316 Types of Early Judaism. (3) A
317 Introduction to Rabbinic Judaism. (3) A
320 Religion in America. (3) F
321 Religion in America. (3) S
330 Native American Religious Traditions. (3) A
331 History of Native American Religious Traditions. (3) N
340 Confucianism and Taoism. (3) A
350 Hinduism. (3) A
351 Buddhism. (3) A
365 Islamic Civilization. (3) A
371 New Testament. (3) A
372 Formation of the Christian Tradition. (3) A
374 Classics of Christian Literature. (3) N
381 Religion and Moral Issues. (3) A
385 Contemporary Religious Thought. (3) A
390 Women and Religion. (3) A
410 Judaism in Modern Times. (3) N
415 The Jewish Mystical Tradition. (3) A
420 Religion in American Life and Thought. (3) A
426 American Preachers and Preaching: The Sermon in America. (3) N
427 American Religious Thought. (3) N
435 Problems in Native American Religions. (3) A
443 Zen. (3) A
444 Religion in Japan. (3) A
454 Hindu Religious Thought. (3) A
460 Studies in Islamic Religion. (3) A
464 The Islamic Mystical Tradition. (3) N
470 Religion in the Middle Ages. (3) A
471 Reformation and Modern Christianity. (3) A
486 Critiques of Religion. (3) A

RUS 321 Survey of Russian Literature. (3) F, S
322 Survey of Russian Literature. (3) F, S
323 Survey of Soviet Literature. (3) F, S
420 Russian Poetry. (3) N
421 Pushkin. (3) N
423 Dostoyevsky. (3) N
424 Tolstoy. (3) N
425 Chekhov. (3) N
426 Soviet Dissident Literature (1917-Present). (3) N
430 Russian Short Story. (3) N
441 Survey of Russian Culture. (3) N

SPA 325 Introduction to Hispanic Literature. (3) F, S
421 Spanish in the Southwest. (3) F
424 Masterpieces of Hispanic Literature. (3) S
425 Spanish Literature. (3) F, S
426 Spanish Literature. (3) F, S
464 Mexican American Literature. (3) F
471 Civilization of the Spanish Southwest. (3) S
472 Spanish-American Civilization. (3) F
473 Spanish Civilization. (3) S

COLLEGE OF PUBLIC PROGRAMS

COM 321 Rhetorical Theory and Research. (3)F, S
344 Oral Traditions in Literature. (3) N
421 Public Address. (3) N

MCO 450 Visual Communication. (3) N

Social and Behavioral Science Core Courses (SB)

COLLEGE OF BUSINESS

ECN 111 Macroeconomic Principles. (3) F, S, SS
112 Microeconomic Principles. (3) F, S, SS
313 Intermediate Macroeconomic Theory. (3) F, S, SS
314 Intermediate Microeconomic Theory. (3) F, S, SS
315 Money and Banking. (3) F, S, SS
321 Labor Economics. (3) A
331 Comparative Economic Systems. (3) A
341 Public Finance. (3) A
360 Economic Development. (3) A
365 Economics of the Soviet Union and Eastern Europe. (3) A
404 History of Economic Thought. (3) A
436 International Trade Theory. (3) F, S, SS

438 International Monetary Economics. (3) F, S, SS
453 Government and Business. (3) A
GNB 101 Elements of Business Enterprise. (3) F, S, SS

COLLEGE OF EDUCATION

EDP 310 Educational Psychology. (1-6) F, S, SS
SPE 311 Orientation to Education of Exceptional Children. (3) F, S, SS
SPF 111 Exploration of Education. (3) F, S
411 History of American Education. (3) N

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

AGB 450 International Agricultural Development. (3) F
458 International Agribusiness. (3) N

COLLEGE OF FINE ARTS

ARS 468 Shamanism and Art. (3) A

COLLEGE OF LIBERAL ARTS AND SCIENCES

AES 201 Aerospace History to WWII. (2) F
202 Aerospace History: WWII to Present. (2) S
301 U.S. Air Force Communication Management and Leadership. (3) F
302 U.S. Air Force Management and Leadership. (3) S
401 National Security Institutional Policy and Strategy. (3) F
402 Topical and Regional Security Issues. (3) S
ASB 102 Introduction to Cultural and Social Anthropology. (3) F, S
311 Principles of Social Anthropology. (3) S
321 Indians of the Southwest. (3) S
330 Principles of Archaeology. (3) F
333 New World Prehistory. (3) S
335 Southwestern Anthropology. (3) N
351 Psychological Anthropology. (3) S
383 Linguistic Theory: Phonetics and Phonology. (4) F
412 History of Anthropology. (3) F
480 Introduction to Linguistics. (3) F
481 Language and Culture. (3) S
483 Sociolinguistics and the Ethnography of Communication. (3) N
ASM 101 Human Origins and the Development of Culture. (3) F, S
348 Social Issues in Human Genetics. (3) S
CDE 232 Human Development. (3) F, S
430 Infant/Toddler Development in the Family. (3) F
437 Observational and Naturalistic Methods of Studying Children. (3) S
FAS 330 Personal Growth in Human Relationships. (3) F, S
331 Family Relationships. (3) F, S
354 Consumer Economics: Issues. (3) F, S
357 Family Resource Management. (3) F, S
435 Advanced Family Relationships. (3) F
FLA 400 Linguistics. (3) S
415 Bilingualism and Languages in Contact. (3) F
480 Methods of Teaching Foreign Languages. (3) F
FRD 272 Basic Issues in Housing. (3) F
GCU 102 Introduction to Human Geography. (3) F, S
121 World Geography. (4) F, S
141 Introduction to Economic Geography. (3) F, S
209 Introduction to the Study of Energy. (3) F
253 Introduction to Cultural and Historical Geography. (3) F, S
294 Global Awareness. (4) F
322 Geography of Anglo-America. (3) F
323 Geography of Latin America. (3) F
325 Geography of Europe. (3) S
326 Geography of Asia. (3) S
327 Geography of Africa. (3) F
328 Geography of Middle East and North Africa. (3) N
350 The Geography of World Crises. (3) F
351 Population Geography. (3) S
352 Political Geography. (3) S
357 Social Geography. (3) F
361 Urban Geography. (3) F, S
364 Geography of Energy. (3) F
401 Topics in Human Geography. (1-3) N
423 Geography of South America. (3) F
424 Geography of Mexico and Middle America. (3) S
426 Geography of the Soviet Union. (3) S
GER 311 German Conversation. (3) F, S
312 German Conversation. (3) F, S
313 German Composition. (3) S
319 Business Correspondence and Communication. (3) N
322 German Literature. (3) S
411 Advanced Grammar and Conversation. (3) F
412 Advanced Grammar and Composition. (3) S
415 German Civilization. (3) F
GPH 381 Geography of Natural Resources. (3) A
405 Energy and Environment. (3) S
HIS 100 Western Civilization. (3) F, S
101 Western Civilization. (3) F, S
102 Western Civilization. (3) F, S
103 The United States. (3) F, S
104 The United States. (3) F, S

107 Introduction to Japan. (3) A
270 Judaism in American History. (3) N
303 American Cultural History. (3) F, S
304 American Cultural History. (3) F, S
305 Asian Civilizations. (3) F, S
306 Asian Civilizations. (3) F, S
320 Ancient Greece. (3) A
321 Rome. (3) A
322 The Middle Ages. (3) A
323 The Middle Ages. (3) A
324 Renaissance. (3) F
325 Reformation. (3) S
326 Early Modern Europe. (3) A
327 Early Modern Europe. (3) A
329 19th Century Europe. (3) A
330 19th Century Europe. (3) A
331 20th Century Europe. (3) N
332 20th Century Europe. (3) N
333 Women and Society in Europe. (3) N
351 England. (3) F, S
352 England. (3) F, S
362 The American Indian. (3) F
364 The Black American Experience. (3) A
365 Islamic Civilization. (3) F
366 The Modern Middle East. (3) S
367 The West in American History. (3) A
368 The West in American History. (3) A
369 The West in the 20th Century. (3) N
370 Women in United States History, 1600-1880. (3) F
371 Women in United States History, 1880-1980. (3) S
373 United States Military History. (3) F, S
374 United States Military History. (3) F, S
380 History of the Mexican-American. (3) A
383 Latin America. (3) A
384 Latin America. (3) A
401 American Colonial History. (3) A
406 Civil War and Reconstruction. (3) A
407 The Emergence of Modern America. (3) A
409 Recent American History. (3) A
410 Recent American History. (3) A
411 Contemporary America. (3) A
413 Origins of the American Economy. (3) F
414 The Modern American Economy. (3) S
415 American Diplomatic History. (3) A
416 American Diplomatic History. (3) A
417 Constitutional History of the United States. (3) N
418 Constitutional History of the United States. (3) N
419 American Urban History. (3) A
420 American Urban History. (3) A
421 History of American Labor. (3) A
422 Social History of American Women. (3) A
423 Recent American Intellectual History. (3) A
424 The Hispanic Southwest. (3) N
425 The American Southwest. (3) N
426 Indian History of the Southwest. (3) S
428 Arizona. (3) A
430 20th Century Chicano History. (3) A
431 The French Revolution and the Napoleonic Era. (3) N
433 Modern France. (3) A
434 Hitler: Man and Legend. (3) N
435 Modern Germany. (3) A
437 Eastern Europe and the Balkans. (3) A
438 Eastern Europe and the Balkans. (3) A
441 Imperial Russia. (3) A
442 The Soviet Union. (3) A
443 Russia and the United States. (3) A
445 Tudor England. (3) A
446 Stuart England. (3) A
449 Modern Britain. (3) A
450 British Constitutional History. (3) A
451 The British Empire. (3) A
452 Economic History of Europe. (3) N
453 Economic History of Europe. (3) N
454 Intellectual History of Modern Europe. (3) A
455 Intellectual History of Modern Europe. (3) A
456 History of Spain. (3) N
457 History of Spain. (3) N
458 Age of Conquest: Latin America. (3) N
459 Change and Reform: Colonial Latin America. (3) N
464 The United States and Latin America. (3) N
466 Mexico. (3) A
467 Mexico. (3) A
469 Chinese Thought and Way. (3) N
470 Chinese Thought and Way. (3) N
471 The United States and Japan. (3) A
472 The United States and China. (3) N
473 China. (3) A
474 China. (3) A
475 The American Experience in Vietnam, 1945-75. (3) N
476 Modern Southeast Asia. (3) N
477 Japan. (3) A
478 Japan. (3) A
479 The Chinese Communist Movement. (3) N
481 The People's Republic of China. (3) N

PGS **100** Introduction to Psychology. (3) F, S, SS
241 Adolescence Psychology. (3) N
270 Psychology of Adjustment. (3) F, S, SS
306 Environmental Psychology. (3) F, S, SS
315 Personality Theory and Research. (3) F, S, SS
331 Sexual Identification. (3) N
332 Human Sexual Behavior. (3) F, S

341 **Developmental Psychology.** (3) F, S
350 **Social Psychology.** (3) F, S, SS
365 **Community Psychology.** (3) F, S
427 **Psychology of Aging.** (3) N
441 **Cognitive Development.** (3) F, S
442 **Life Span Development.** (3) N
443 **Abnormal Child Psychology.** (3) F, S
445 **Child Language and Drawing.** (3) F
459 **Attitudes and Attitude Change.** (3) S
461 **Interpersonal Influence.** (3) N
466 **Abnormal Psychology.** (3) F, S, SS

PHI 325 **Philosophy of Social Science.** (3) N

POS 101 **Political Ideologies.** (3) F, S
110 **Government and Politics.** (3) F, S
120 **Political Issues and Public Policy.** (3) A
150 **Comparative Government.** (3) F, S
160 **Global Politics.** (3) F, S
170 **American Legal System.** (3) F, S
301 **Empirical Political Inquiry.** (3) F, S
310 **American National Government.** (3) F, S
311 **Arizona Constitution and Government.** (2) F, S
313 **The Congress.** (3) A
314 **The American Presidency.** (3) A
315 **The Supreme Court.** (3) A
316 **State and Local Government.** (3) A
320 **Public Administration.** (3) A
325 **Public Policy Development.** (3) A
330 **Current Issues in National Politics.** (3) F, S
331 **Public Opinion.** (3) A
332 **American Political Parties.** (3) A
333 **Interest Groups.** (3) A
336 **Electoral Behavior.** (3) A
350 **Comparative Politics.** (3) A
351 **The British Nations.** (3) A
352 **Revolution and the Social System.** (3) A
356 **Western Europe.** (3) A
360 **Current Issues in International Politics.** (3) F, S
361 **American Foreign Policy.** (3) A
410 **Urban Government and Politics.** (3) A
417 **The Arizona Political System.** (3) N
422 **Politics of Bureaucracy.** (3) N
423 **Politics of Budgeting.** (3) N
424 **Regulatory Politics.** (3) N
426 **Elements of Public Policy.** (3) A
435 **Women, Power and Politics.** (3) N
439 **Minority Group Politics in America.** (3) N
445 **Asian Political Thought.** (3) A
450 **Soviet Union and Eastern Europe.** (3) A
451 **China, Japan, and the Koreas.** (3) A
452 **China.** (3) A
453 **South America.** (3) A
454 **Mexico.** (3) A
455 **Central America and the Caribbean.** (3) A
456 **Comparative Legislative Processes.** (3) A
458 **Southeast Asia.** (3) A
459 **Sub-Saharan Africa.** (3) N
460 **World Politics.** (3) A
462 **Soviet Foreign and Defense Policies.** (3) A
463 **Inter-American Relations.** (3) A
464 **American Defense Policy.** (3) A
465 **International Organization and Law.** (3) A
467 **Comparative Defense Policy.** (3) A
468 **Comparative Asian Foreign Policies.** (3) A
470 **Law and Society.** (3) A
471 **Constitutional Law I.** (3) A
472 **Constitutional Law II.** (3) A
476 **Political Economy.** (3) A
477 **International Political Economy.** (3) A
484 **Internship.** (1-6) A

REL 365 **Islamic Civilization.** (3) A

RUS 211 **Basic Russian Conversation.** (3) F, S
212 **Basic Russian Conversation.** (3) F, S
311 **Russian Composition and Conversation.** (3) F, S
312 **Russian Composition and Conversation.** (3) F, S
411 **Advanced Composition and Conversation.** (3) F, S
412 **Advanced Composition and Conversation.** (3) F, S
417 **Applied Russian Phonetics.** (2) N
418 **Applied Russian Phonetics.** (2) N
440 **History of the Russian Language.** (3) N
441 **Survey of Russian Culture.** (3) N

SHS 305 **Survey of Communication Disorders.** (3) F, S, SS

SOC 101 **Introductory Sociology.** (3) F, S, SS
301 **Principles of Sociology.** (3) F, S, SS
305 **Courtship and Marriage.** (3) F, S, SS
332 **The Modern City.** (3) F, S
333 **Population Problems.** (3) F, S, SS
340 **Sociology of Deviant Behavior.** (3) F, S, SS
341 **Modern Social Problems.** (3) F, S, SS
348 **Overview of Aging.** (3) F
351 **Industrial Sociology.** (3) S
352 **Social Change.** (3) F, S
360 **Sociological Psychology.** (3) F, S
361 **Variant Sexuality.** (3) F
362 **Sociology of Adolescence.** (3) F, S
365 **The Sociology of Mass Communication.** (3) F, S
391 **Sociological Research.** (3) F, S, SS
392 **Practicum in Survey Research I.** (3) F
393 **Practicum in Survey Research II.** (3) S
401 **Comparative Sociology.** (3) F
410 **Sociology of Religion.** (3) S
415 **The Family.** (3) F, S, SS

	416	**Marriage Problems in Contemporary Society.** (3) S
	417	**Family Violence.** (3) F, S
	432	**Human Ecology.** (3) F, S
	433	**Demography.** (3) S
	440	**Racial and Ethnic Minorities.** (3) F, S, SS
	446	**Sociology of Crime.** (3) F
	448	**Sociology of Aging.** (3) F, S
	449	**Sociology of Law.** (3) S
	452	**Sociology of Complex Organizations.** (3) F
	453	**Social Class and Stratification.** (3) S
	454	**The Afro-American in Modern Society.** (3) S
	455	**Collective Behavior.** (3) S
	456	**Political Sociology.** (3) S
	457	**Sociology of Health and Illness.** (3) F
	462	**Social Control.** (3) F
	464	**Women's Roles.** (3) S
	483	**History of Social Thought.** (3) S, SS
	485	**Sociology of Knowledge.** (3) F
	486	**Contemporary Theory.** (3) S
	498	**Pro-Seminar: Alternate Futures.** (3) F, S
SPA	420	**Applied Spanish Linguistics.** (3) S
	421	**Spanish in the Southwest.** (3) F
	471	**Civilization of the Spanish Southwest.** (3) S
	472	**Spanish-American Civilization.** (3) F
	473	**Spanish Civilization.** (3) S
TXC	122	**Clothing and Human Behavior.** (3) F, S
	424	**History of Costume.** (3) F, S
WST	100	**Women and Society.** (3) F, S
	300	**Women in Contemporary Society.** (3) F, S, SS
	498	**Pro-Seminar: Theoretical Issues in Women's Studies.** (3) A

COLLEGE OF NURSING

NUR	457	**Third-World Women.** (3) F

COLLEGE OF PUBLIC PROGRAMS

COM	100	**Introduction to Human Communication.** (3) F, S, SS
	230	**Small Group Communications.** (3) F, S, SS
	250	**Introduction to Organizational Communication.** (3) F, S
	263	**Elements of Intercultural Communication.** (3) F, S
	320	**Communication and Consumerism.** (3) F, S
	329	**Persuasion.** (3) A
	363	**Intercultural Communication Processes.** (3) F, S
	410	**Interpersonal Communication Theory and Research.** (3) A
	430	**Leadership in Group Communications.** (3) N
	450	**Theory and Research in Organizational Communication.** (3) F, S
	456	**Political Communication.** (3) A
	457	**Communication and Information Diffusion.** (3) N
	472	**Development of Language as Communicative Behavior.** (3) N
JUS	100	**The Justice System.** (3) F, S, SS
	200	**Concepts and Issues of Justice.** (3) F, S, SS
	360	**Law and Social Control.** (3) F, S, SS
	463	**Discretionary Justice.** (3) F, S, SS
	469	**Political Deviance and the Law.** (3) F, S, SS
MCO	120	**Media and Society.** (3) F, S
	314	**History of Communications.** (3) F, S
REC	120	**Social Psychology of Play.** (3) F, S
	160	**Leisure and Society.** (3) F, S

SCHOOL OF SOCIAL WORK

SWU	301	**Human Behavior in the Social Environment I.** (3) F, S
	402	**Human Behavior in the Social Environment II.** (3) F, S

Natural Science Core Courses, Introductory (S1)

COLLEGE OF LIBERAL ARTS AND SCIENCES

AST	111	**Introduction to Astronomy, I.** (3) F, SS
	112	**Introduction to Astronomy, II.** (3) S, SS
	125	**Astronomy Laboratory, I.** (1) F
	126	**Astronomy Laboratory, II.** (1) S
	321	**Solar System Astronomy.** (3) F, SS
	322	**Stars, Galaxies, and the Universe.** (3) S, SS
BIO	100	**The Living World.** (4) F, S, SS
	181	**General Biology .** (4) F, S
BOT	108	**Plants and Society.** (4) F, S, SS
CHM	101	**Introductory Chemistry.** (4) F, S
	113	**General Chemistry.** (4) F, S, SS
	114	**General Chemistry for Engineers.** (4) F, S
	115	**General Chemistry With Qualitative Analysis.** (5) F, S, SS
	116	**General Chemistry.** (4) F, S
	117	**Advanced General Chemistry.** (4) F
	118	**Advanced General Chemistry.** (5) S
GLG	101	**Introduction to Geology.** (3) F, S
	103	**Introduction to Geology Laboratory.** (1) F, S
	104	**Historical Geology and Modern Problems Laboratory.** (1) S

GPH 111 **Introduction to Physical Geography.** (4) F, S

PHS 110 **Fundamentals of Physical Science.** (4) F, S

PHY 101 **Introduction to Physics.** (4) F, S
105 **Basic Physics.** (4) F
111 **General Physics.** (3) F, S, SS1
112 **General Physics.** (3) F, S, SS2
113 **General Physics Laboratory.** (1) F, S, SS1
114 **General Physics Laboratory.** (1) F, S, SS2
116 **University Physics.** (4) F
118 **University Physics Laboratory.** (1) F
121 **University Physics I: Mechanics.** (3) F, S, SS
122 **University Physics Laboratory I.** (1) F, S, SS
131 **University Physics II: Electricity and Magnetism.** (3) S, SS
132 **University Physics Laboratory II.** (1) S, SS
241 **University Physics III: Thermodynamics, Optics and Wave Phenomena.** (3) N
242 **University Physics Laboratory III.** (1) N

Natural Science Core Courses, Additional Courses (S2)

COLLEGE OF LIBERAL ARTS AND SCIENCES

ASB 231 **Archaeological Field Methods.** (4) S

ASM 342 **Human Biological Variation.** (4) S
452 **Dental Anthropology.** (4) F

AST 111 **Introduction to Astronomy, I.** (3) F, SS
112 **Introduction to Astronomy, II.** (3) S, SS
125 **Astronomy Laboratory, I.** (1) F
126 **Astronomy Laboratory, II.** (1) S
321 **Solar System Astronomy.** (3) F, SS
322 **Stars, Galaxies, and the Universe.** (3) S, SS

BIO 100 **The Living World.** (4) F, S, SS
181 **General Biology.** (4) F, S
182 **General Biology.** (4) F, S

BOT 108 **Plants and Society.** (4) F, S, SS
300 **Survey of the Plant Kingdom.** (4) F

CHM 101 **Introductory Chemistry.** (4) F, S
113 **General Chemistry.** (4) F, S, SS
114 **General Chemistry for Engineers.** (4) F, S
115 **General Chemistry With Qualitative Analysis.** (5) F, S, SS
116 **General Chemistry.** (4) F, S
117 **Advanced General Chemistry.** (4) F
118 **Advanced General Chemistry.** (5) S

GLG 101 **Introduction to Geology.** (3) F, S
102 **Historical Geology and Modern Problems.** (3) S
103 **Introduction to Geology Laboratory.** (1) F, S

GPH 111 **Introduction to Physical Geography.** (4) F, S
212 **Introduction to Meteorology I.** (3) A
214 **Introductory Meteorology Laboratory.** (1) A

MIC 205 **Microbiology.** (3) F, S, SS
206 **Microbiology Laboratory.** (1) F, S, SS

PHS 110 **Fundamentals of Physical Science.** (4) F, S

PHY 101 **Introduction to Physics.** (4) F, S
105 **Basic Physics.** (4) F
111 **General Physics.** (3) F, S, SS1
112 **General Physics.** (3) F, S, SS2
113 **General Physics Laboratory.** (1) F, S, SS1
114 **General Physics Laboratory.** (1) F, S, SS2
116 **University Physics.** (4) F
118 **University Physics Laboratory.** (1) F
121 **University Physics I: Mechanics.** (3) F, S, SS
122 **University Physics Laboratory I.** (1) F, S, SS
131 **University Physics II: Electricity and Magnetism.** (3) S, SS
132 **University Physics Laboratory II.** (1) S, SS
241 **University Physics III: Thermodynamics, Optics and Wave Phenomena.** (3) N
242 **University Physics Laboratory III.** (1) N

PSY 290 **Experimental Psychology.** (4) F, S

ZOL 201 **Human Anatomy-Physiology.** (4) F, S, SS

Global Awareness Courses (G)
Courses Concurrently Satisfying a Core Area Requirement

			L2	HU	SB	G
COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN						
APH	100	Introduction to Environmental Design I. (2) F, S		X		X
	305	Contemporary Architecture. (3) N		X		X
	446	20th Century Architecture I. (3) F		X		X
	447	20th Century Architecture II. (3) S		X		X
DSC	100	Contemporary International Design. (3) F, S		X		X
PUP	100	Introducton to Environmental Design I. (2) F, S		X		X
COLLEGE OF BUSINESS						
ECN	331	Comparative Economic Systems. (3) A		X		X
	360	Economic Development. (3) A		X		X
	365	Economics of the Soviet Union and Eastern Europe. (3) A		X		X
	436	International Trade Theory. (3) F, S, SS		X		X
	438	International Monetary Economics. (3) F, S, SS		X		X
COLLEGE OF ENGINEERING AND APPLIED SCIENCES						
AGB	450	International Agricultural Development. (3) F		X		X
	458	International Agribusiness. (3) N		X		X
COLLEGE OF FINE ARTS						
ARS	201	Art of the Non-Western World I. (3) A		X		X
	202	Art of the Non-Western World II. (3) A		X		X
	468	Shamanism and Art. (3) A		X	X	X
	469	Mexican Art. (3) A		X		X
	472	Art of China. (3) A		X		X
	473	Art of Japan. (3) A		X		X
COLLEGE OF LIBERAL ARTS AND SCIENCES						
ASB	102	Introduction to Cultural and Social Anthropology. (3) F, S		X		X
FLA	150	Introduction to East Asian Culture. (3) S		X		X
	420	Foreign Literature in Translation. (3)F, S		X		X
FRE	205	Intermediate Reading. (4) F, S		X		X
	415	French Civilization. (3) S		X		X
GCU	121	World Geography. (4) F, S		X		X
	294	Global Awareness. (4) F		X		X
	323	Geography of Latin America. (3) F		X		X
	326	Geography of Asia. (3) S		X		X
	327	Geography of Africa. (3) F		X		X
	328	Geography of Middle East and North Africa. (3) N		X		X
	350	The Geography of World Crises. (3) F		X		X
	352	Political Geography. (3) S		X		X
	423	Geography of South America. (3) F		X		X
	424	Geography of Mexico and Middle America. (3) S		X		X
	426	Geography of the Soviet Union. (3) S		X		X
GER	311	German Conversation. (3) F, S		X	X	X
	312	German Conversation. (3) F, S		X	X	X
	313	German Composition. (3) S		X	X	X
	319	Business Correspondence and Communication. (3) N		X		X
	322	German Literature. (3) F, S		X	X	X
	411	Advanced Grammar and Conversation. (3) F, S		X	X	X
	412	Advanced Grammar and Composition. (3) F, S		X	X	X
	415	German Civilization. (3) F		X	X	X

			L2	HU	SB	G
HIS	102	**Western Civilization.** (3) F, S			X	X
	107	**Introduction to Japan.** (3) A			X	X
	305	**Asian Civilizations.** (3) F, S			X	X
	306	**Asian Civilizations.** (3) F, S			X	X
	331	**20th Century Europe.** (3) N			X	X
	332	**20th Century Europe.** (3) N			X	X
	365	**Islamic Civilization.** (3) F		X	X	X
	366	**The Modern Middle East.** (3) S			X	X
	374	**United States Military History.** (3) F, S			X	X
	416	**American Diplomatic History.** (3) A			X	X
	433	**Modern France.** (3) A			X	X
	435	**Modern Germany.** (3) A			X	X
	438	**Eastern Europe and the Balkans.** (3) A			X	X
	442	**The Soviet Union.** (3) A			X	X
	443	**Russia and the United States.** (3) A			X	X
	449	**Modern Britain.** (3) A			X	X
	453	**Economic History of Europe.** (3) N			X	X
	464	**The United States and Latin America.** (3) N			X	X
	470	**Chinese Thought and Way.** (3) N			X	X
	471	**The United States and Japan.** (3) A			X	X
	472	**The United States and China.** (3) N			X	X
	474	**China.** (3) A			X	X
	475	**The American Experience in Vietnam, 1945-75.** (3) N			X	X
	478	**Japan.** (3) A			X	X
	479	**The Chinese Communist Movement.** (3) N			X	X
	481	**The People's Republic of China.** (3) N			X	X
HUM	110	**Contemporary Issues in Humanities.** (3) F		X		X
ITA	314	**Advanced Italian.** (3) N		X		X
	415	**Italian Civilization.** (3) N		X		X
	449	**20th Century Italian Literature.** (3) N		X		X
JPN	321	**Japanese Literature.** (3) N	X			X
POR	313	**Portuguese Composition and Conversation.** (3) F, S		X		X
	314	**Portuguese Composition and Conversation.** (3) F, S		X		X
	472	**Luso-Brazilian Civilization.** (3) N		X		X
POS	150	**Comparative Government.** (3) F, S			X	X
	160	**Global Politics.** (3) F, S			X	X
	350	**Comparative Politics.** (3) A			X	X
	351	**The British Nations.** (3) A			X	X
	356	**Western Europe.** (3) A			X	X
	360	**Current Issues in International Politics.** (3) F, S			X	X
	445	**Asian Political Thought.** (3) A			X	X
	448	**China, Japan, and the Koreas.** (3) A			X	X
	450	**Soviet Union and Eastern Europe.** (3) A			X	X
	452	**China.** (3) A			X	X
	453	**South America.** (3) A			X	X
	454	**Mexico.** (3) A			X	X
	455	**Central America and the Caribbean.** (3) A			X	X
	458	**Southeast Asia.** (3) A			X	X
	459	**Sub-Saharan Africa.** (3) N			X	X
	460	**World Politics.** (3) A			X	X
	462	**Soviet Foreign and Defense Policies.** (3) A			X	X
	463	**Inter-American Relations.** (3) A			X	X
	465	**International Organization and Law.** (3) A			X	X

			L2	HU	SB	G
	467	**Comparative Defense Policy.** (3) A			X	X
	468	**Comparative Asian Foreign Policies.** (3) A			X	X
	477	**International Political Economy.** (3) A			X	X
REL	100	**Religions of the World.** (3) F, S		X		X
	305	**Ritual, Symbol, and Myth.** (3) A	X	X		X
	315	**Hebrew Bible (Old Testament).** (3) A	X	X		X
	350	**Hinduism.** (3) A	X	X		X
	365	**Islamic Civilization.** (3) A		X	X	X
	443	**Zen.** (3) A		X		X
	444	**Religion in Japan.** (3) A		X		X
	460	**Studies in Islamic Religion.** (3) A		X		X
	464	**The Islamic Mystical Tradition.** (3) N		X		X
RUS	211	**Basic Russian Conversation.** (3) F, S			X	X
	212	**Basic Russian Conversation.** (3) F, S			X	X
	311	**Russian Composition and Conversation.** (3) F			X	X
	312	**Russian Composition and Conversation.** (3) S			X	X
	323	**Survey of Soviet Literature.** (3) F, S	X	X		X
	411	**Advanced Composition and Conversation.** (3) F, S			X	X
	412	**Advanced Composition and Conversation.** (3) F, S			X	X
	426	**Soviet Dissident Literature (1917-Present).** (3) N	X	X		X
	441	**Survey of Russian Culture.** (3) N		X	X	X
SOC	333	**Population Problems.** (3) F, S, SS			X	X
	352	**Social Change.** (3) F, S			X	X
	361	**Variant Sexuality.** (3) F			X	X
	401	**Comparative Sociology.** (3) F			X	X
	456	**Political Sociology.** (3) S			X	X
	498	**Pro-Seminar: Alternate Futures.** (3) F, S			X	X
SPA	472	**Spanish-American Civilization.** (3) F			X	X
	473	**Spanish Civilization.** (3) S			X	X

COLLEGE OF NURSING

NUR	457	**Third-World Women.** (3) F			X	X

COLLEGE OF PUBLIC PROGRAMS

COM	263	**Elements of Intercultural Communication.** (3) F, S			X	X

Global Awareness Courses (G)
Courses Not Concurrently Satisfying a Core Area Requirement

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN

APH	300	**World Architecture I/WesternCultures.** (3) F
	301	**World Architecture II/Eastern Cultures.** (3) S

COLLEGE OF BUSINESS

IBS	300	**Principles of International Business.** (3) F, S, SS

COLLEGE OF EDUCATION

SPF	494	**Third-World Women.** (3) F

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

AET	308	**Air Transportation.** (3) F
AGB	101	**Food Chain.** (2) F
ERA	346	**Environmental Conservation.** (3) F

COLLEGE OF LIBERAL ARTS AND SCIENCES

ASB	211	**Women in Other Cultures.** (3) N
	294	**Introduction to Southeast Asia.** (3) N
	322	**Indians of Mesoamerica.** (3) S
	324	**Peoples of the Pacific.** (3) N

	325	**Peoples of Southeast Asia.** (3) F
	334	**Arctic Anthropology.** (3) S
BIO	330	**Ecology and Conservation.** (3) F
CHI	201	**Intermediate Chinese.** (5) F, S
	202	**Intermediate Chinese.** (5) F, S
	207	**Chinese for International Professions II.** (10) S
	309	**Chinese Conversation.** (2) F
	310	**Chinese Conversation.** (2) S
	311	**Chinese Conversation.** (2) F
	312	**Chinese Conversation.** (2) S
	313	**Advanced Chinese.** (3) F, S
	314	**Advanced Chinese.** (3) F, S
	321	**Chinese Literature.** (3) F, S
	322	**Chinese Literature.** (3) F, S
FAS	494	**Third-World Women.** (3) F
FRE	201	**Intermediate Grammar Review.** (4) F, S, SS
	203	**French Conversation.** (4) F, S, SS
	207	**French for International Professions II.** (8) S
	311	**French Conversation.** (3) F, S
	312	**French Composition.** (3) F, S
	319	**Business Correspondence and Communication.** (3) S
	411	**Advanced Spoken French.** (3) F
	412	**Advanced Written French.** (3) S
GCU	294	**Introduction to Southeast Asia.** (3) N
	359	**Cities of the World.** (3) A
	360	**Cities of the World.** (3) A
GER	201	**Intermediate German.** (4) F, S, SS
	202	**Intermediate German.** (4) F, S, SS
HIS	105	**China: Literature and Revolution.** (3) N
	294	**Introduction to Southeast Asia** (3) N
ITA	201	**Intermediate Italian.** (4) F, S
	202	**Intermediate Italian.** (4) F, S
	311	**Italian Composition and Conversation.** (3) F, S
	312	**Italian Composition and Conversation.** (3) F, S
JPN	201	**Intermediate Japanese.** (5) F, S
	202	**Intermediate Japanese.** (5) F, S
	207	**Japanese for International Professions II.** (10) S
	309	**Intermediate Japanese Conversation.** (2) F, S
	310	**Intermediate Japanese Conversation.** (2) F, S
	311	**Japanese Conversation and Composition.** (3) F, S
	312	**Japanese Conversation and Composition.** (3) F, S
	313	**Advanced Japanese.** (3) F, S
	314	**Advanced Japanese.** (3) F, S
POR	201	**Intermediate Portuguese.** (5) S
POS	361	**American Foreign Policy.** (3) A
	294	**Introduction to Southeast Asia** (3) N
REL	294	**Introduction to Southeast Asia** (3) N
RUS	201	**Intermediate Russian.** (4) F, S, SS
	202	**Intermediate Russian.** (4) F, S, SS
SOC	294	**Introduction to Southeast Asia.** (3) N
SPA	201	**Intermediate Spanish.** (4) F, S, SS
	202	**Intermediate Spanish.** (4) F, S, SS
	203	**Intermediate Spanish for Bilinguals.** (4) F, S
	204	**Intermediate Spanish for Bilinguals.** (4) F, S
	207	**Spanish for International Professions II.** (8) S
	311	**Spanish Conversation.** (3) F, S
	312	**Spanish Conversation.** (3) F, S
	313	**Spanish Conversation and Composition.** (3) F, S, SS
	314	**Spanish Conversation and Composition.** (3) F, S, SS
	319	**Business Correspondence and Communication.** (3) S
	412	**Advanced Conversation and Composition.** (3) F, S
	413	**Advanced Spanish Grammar.** (3) F
	428	**Spanish-American Literature.** (3) S
WST	494	**Third-World Women.** (3) F

COLLEGE OF PUBLIC PROGRAMS

COM	371	**Language, Culture, and Communication** (3) A
MCO	430	**International Communication.** (3) F, S
REC	458	**International Tourism.** (3) F, S

Historical Awareness Courses (H)
Courses Concurrently Satisfying a Core Area Requirement

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN			L1	L2	HU	SB	H
APH	100	Introduction to Environmental Design I. (2) F, S			X		X
	101	Introduction to Environmental Design II. (2) F, S			X		X
	304	American Architecture. (3) N			X		X
	305	Contemporary Architecture. (3) N			X		X
	311	Survey of Mexican Architecture. (2) N			X		X
	313	History of Western Architecture I. (3) F, S			X		X
	441	Ancient Architecture. (3) N			X		X
	443	Renaissance Architecture. (3) N			X		X
	444	Baroque Architecture. (3) N			X		X
	445	19th Century Architecture. (3) N			X		X
	446	20th Century Architecture I. (3) F			X		X
	447	20th Century Architecture II. (3) S			X		X
DSC	216	History of Interior Design I. (3) F			X		X
	316	20th Century Design I. (3) F			X		X
	317	20th Century Design II. (3) S			X		X
PUP	100	Introduction to Environmental Design I. (2) F, S			X		X
	101	Introduction to Environmental Design II. (2) F, S			X		X

COLLEGE OF ENGINEERING AND APPLIED SCIENCES							
STE	310	Man and Machine. (2) A			X		X
	311	Science and Technology in History. (3) F			X		X
	312	Science and Technology in History. (3) S			X		X

COLLEGE OF FINE ARTS							
ARS	100	Introduction to Art. (3) F, S, SS			X		X
	101	Art of the Western World I. (3) F, S			X		X
	102	Art of the Western World II. (3) F, S			X		X
	201	Art of the Non-Western World I. (3) A			X		X
	202	Art of the Non-Western World II. (3) A			X		X
	300	Introduction to Art. (3) F, S			X		X
	325	History of Christian Art. (3) N			X		X
	400	History of Printmaking. (3) A			X		X
	402	Ancient Near Eastern Art. (3) N			X		X
	404	Greek Art. (3) A			X		X
	406	Roman Art. (3) A			X		X
	410	Early Christian and Byzantine Art. (3) A			X		X
	412	Early Medieval Art. (3) A			X		X
	414	Romanesque Art. (3) A			X		X
	416	Gothic Art. (3) A			X		X
	418	Renaissance Art in Northern Europe. (3) A			X		X
	420	Early Renaissance Art in Italy. (3) A			X		X
	424	Italian Baroque Art. (3) A			X		X
	426	Art of the 17th Century in Northern Europe. (3) A			X		X
	428	Art of the 18th Century. (3) A			X		X
	430	Art of Spain and Its Colonies. (3) A			X		X
	439	Art of the 20th Century II. (3) A			X		X
	450	19th Century Photography. (3) A			X		X
	451	20th Century Photography. (3) A			X		X
	456	History of Art Criticism I. (3) N			X		X
	457	History of Art Criticism II. (3) N			X		X
	462	Pre-Columbian Art I. (3) A			X		X

			L1	L2	HU	SB	H
	466	**Southwest Indian Art.** (3) A			X		X
	469	**Mexican Art.** (3) A			X		X
	472	**Art of China.** (3) A			X		X
	473	**Art of Japan.** (3) A			X		X
	475	**Chinese Painting.** (3) A			X		X
	480	**Research Methods.** (3) F, S			X		X
DAH	401	**Dance History I.** (3) F			X		X
	402	**Dance History II.** (3) S			X		X
MUS	340	**Survey of Music History.** (3) F, S, SS			X		X
	353	**Survey of Afro-American Music.** (3) A			X		X
THE	320	**History of the Theatre.** (3) F, S				X	X
	321	**History of the Theatre.** (3) F, S				X	X
	420	**History of the American Theatre.** (3) S				X	X
	421	**History of the English Theatre.** (3) F				X	X

COLLEGE OF LIBERAL ARTS AND SCIENCES

AES	201	**Aerospace History to WWII.** (2) F			X		X
	202	**Aerospace History: WWII to Present.** (2) S			X		X
ASB	321	**Indians of the Southwest.** (3) S			X		X
	333	**New World Prehistory.** (3) S		X	X		X
	335	**Southwestern Anthropology.** (3) N			X		X
ASM	101	**Human Origins and the Development of Culture.** (3) F, S			X		X
ENG	110	**Introduction to Literature.** (3) F, S			X		X
	201	**World Literature.** (3) F			X		X
	202	**World Literature.** (3) S			X		X
	221	**Survey of English Literature.** (3) F, S			X		X
	222	**Survey of English Literature.** (3) F, S			X		X
	341	**American Literature.** (3) F, S			X		X
	342	**American Literature.** (3) F, S			X		X
	355	**History of the Drama.** (3) S			X		X
	356	**Biblical Backgrounds of Literature.** (3) F, S			X		X
	358	**Afro-American Literature.** (3) N		X	X		X
	359	**American Indian Literatures.** (3) S			X		X
	360	**History of Film.** (4) N			X		X
	361	**Silent Film.** (4) F			X		X
	400	**History of Literary Criticism.** (3) S		X	X		X
	419	**English Literature in the Early Seventeenth Century.** (3) S		X	X		X
	420	**Renaissance Drama.** (3) S			X		X
	421	**Shakespeare I.** (3) F, S			X		X
	426	**Victorian Poetry.** (3) S		X	X		X
	427	**Age of Johnson.** (3) S		X	X		X
	428	**Age of Dryden, Swift, and Pope.** (3) F		X	X		X
	430	**19th Century British Cultural Backgrounds.** (3) N		X	X		X
	435	**19th Century American Poetry.** (3) F			X		X
	440	**American Literature to 1815.** (3) N			X		X
	443	**American Poetry, 1900-1945.** (3) F			X		X
	444	**American Romanticism, 1830-60.** (3) F			X		X
	445	**American Realism, 1860-1900.** (3) S			X		X
	451	**The Novel to Jane Austen.** (3) F		X	X		X
	452	**The 19th Century Novel.** (3) S		X	X		X
	453	**The American Novel to 1900.** (3) F		X	X		X
	454	**The American Novel, 1900-1945.** (3) F			X		X
	460	**Western American Literature.** (3) S			X		X

			L1	L2	HU	SB	H
	461	**Women and Literature.** (3) N			X		X
	463	**European Drama from Ibsen to 1914.** (3) N			X		X
	464	**European Drama from 1914 to the Present.** (3) N			X		X
FLA	420	**Foreign Literature in Translation.** (3) F, S			X		X
FRE	321	**French Literature.** (3) F, S		X		X	X
	322	**French Literature.** (3) F, S		X		X	X
	441	**French Literature of the 17th Century.** (3) F			X		X
	442	**French Literature of the 17th Century.** (3) S			X		X
	452	**French Novel of the 19th Century.** (3) S			X		X
GCU	253	**Introduction to Cultural and Historical Geography.** (3) F, S				X	X
GER	415	**German Civilization.** (3) F				X	X
HIS	100	**Western Civilization.** (3) F, S				X	X
	101	**Western Civilization.** (3) F, S				X	X
	102	**Western Civilization.** (3) F, S				X	X
	103	**The United States.** (3) F, S				X	X
	104	**The United States.** (3) F, S				X	X
	107	**Introduction to Japan.** (3) A				X	X
	270	**Judaism in American History.** (3) N				X	X
	303	**American Cultural History.** (3) F				X	X
	304	**American Cultural History.** (3) S				X	X
	305	**Asian Civilizations.** (3) F				X	X
	306	**Asian Civilizations.** (3) S				X	X
	320	**Ancient Greece.** (3) A				X	X
	321	**Rome.** (3) A				X	X
	322	**The Middle Ages.** (3) A				X	X
	323	**The Middle Ages.** (3) A				X	X
	324	**Renaissance.** (3) F				X	X
	325	**Reformation.** (3) S				X	X
	326	**Early Modern Europe.** (3) A				X	X
	327	**Early Modern Europe.** (3) A				X	X
	329	**19th Century Europe.** (3) A				X	X
	330	**19th Century Europe.** (3) A				X	X
	331	**20th Century Europe.** (3) N				X	X
	332	**20th Century Europe.** (3) N				X	X
	333	**Women and Society in Europe.** (3) N			X	X	X
	351	**England.** (3) F				X	X
	352	**England.** (3) S				X	X
	362	**The American Indian.** (3) F				X	X
	364	**The Black American Experience.** (3) A				X	X
	365	**Islamic Civilization.** (3) F			X	X	X
	366	**The Modern Middle East.** (3) S				X	X
	367	**The West in American History.** (3) A				X	X
	368	**The West in American History.** (3) A				X	X
	369	**The West in the 20th Century.** (3) N				X	X
	370	**Women in United States History, 1600-1880.** (3) F				X	X
	371	**Women in United States History, 1880-1980.** (3) S				X	X
	373	**United States Military History.** (3) F				X	X
	374	**United States Military History.** (3) S				X	X
	380	**History of the Mexican-American.** (3) A				X	X
	383	**Latin America.** (3) A				X	X
	384	**Latin America.** (3) A				X	X
	401	**American Colonial History.** (3) A				X	X
	406	**Civil War and Reconstruction.** (3) A				X	X
	407	**The Emergence of Modern America.** (3) A				X	X

		L1	L2	HU	SB	H
409	**Recent American History.** (3) A				X	X
410	**Recent American History.** (3) A				X	X
411	**Contemporary America.** (3) A				X	X
413	**Origins of the American Economy.** (3) F				X	X
414	**The Modern American Economy.** (3) S				X	X
415	**American Diplomatic History.** (3) A				X	X
416	**American Diplomatic History.** (3) A				X	X
417	**Constitutional History of the United States.** (3) N				X	X
418	**Constitutional History of the United States.** (3) N				X	X
419	**American Urban History.** (3) A				X	X
420	**American Urban History.** (3) A				X	X
421	**History of American Labor.** (3) A				X	X
422	**Social History of American Women.** (3) A				X	X
423	**Recent American Intellectual History.** (3) A				X	X
424	**The Hispanic Southwest.** (3) N				X	X
425	**The American Southwest.** (3) N				X	X
426	**Indian History of the Southwest.** (3) S				X	X
428	**Arizona.** (3) A				X	X
430	**20th Century Chicano History.** (3) A				X	X
431	**The French Revolution and the Napoleonic Era.** (3) N				X	X
433	**Modern France.** (3) A				X	X
434	**Hitler: Man and Legend.** (3) N				X	X
435	**Modern Germany.** (3) A				X	X
437	**Eastern Europe and the Balkans.** (3) A				X	X
438	**Eastern Europe and the Balkans.** (3) A				X	X
441	**Imperial Russia.** (3) A				X	X
442	**The Soviet Union.** (3) A				X	X
443	**Russia and the United States.** (3) A				X	X
445	**Tudor England.** (3) A				X	X
446	**Stuart England.** (3) A				X	X
449	**Modern Britain.** (3) A				X	X
450	**British Constitutional History.** (3) A				X	X
451	**The British Empire.** (3) A				X	X
452	**Economic History of Europe.** (3) N				X	X
453	**Economic History of Europe.** (3) N				X	X
454	**Intellectual History of Modern Europe.** (3) A				X	X
455	**Intellectual History of Modern Europe.** (3) A				X	X
456	**History of Spain.** (3) N				X	X
457	**History of Spain.** (3) N				X	X
458	**Age of Conquest: Latin America.** (3) N				X	X
459	**Change and Reform: Colonial Latin America.** (3) N				X	X
464	**The United States and Latin America.** (3) N				X	X
466	**Mexico.** (3) A				X	X
467	**Mexico.** (3) A				X	X
469	**Chinese Thought and Way.** (3) N				X	X
470	**Chinese Thought and Way.** (3) N				X	X
471	**The United States and Japan.** (3) A				X	X
472	**The United States and China.** (3) N				X	X
473	**China.** (3) A				X	X
474	**China.** (3) A				X	X
475	**The American Experience in Vietnam, 1945-75.** (3) N				X	X
476	**Modern Southeast Asia.** (3) N				X	X
477	**Japan.** (3) A				X	X
478	**Japan.** (3) A				X	X

			L1	L2	HU	SB	H
	479	**The Chinese Communist Movement.** (3) N				X	X
	481	**The People's Republic of China.** (3) N				X	X
HPS	321	**Man and Machine.** (2) A			X		X
	322	**Science and Technology in History.** (3) F			X		X
	323	**Science and Technology in History.** (3) S			X		X
HUM	110	**Contemporary Issues in Humanities.** (3) F			X		X
	301	**Humanities in the Western World.** (4) F			X		X
	302	**Humanities in the Western World.** (4) S			X		X
ITA	314	**Advanced Italian.** (3) N			X		X
	325	**Introduction to Italian Literature.** (3) F			X		X
	415	**Italian Civilization.** (3) N			X		X
	430	**Italian Literature of the Middle Ages.** (3) N			X		X
	441	**Dante: *Divina Commedia.*** (3) N			X		X
	443	**Italian Literature of the Renaissance.** (3) N			X		X
	446	**Italian Literature of the 18th and 19th Century.** (3) N			X		X
	449	**20th Century Italian Literature.** (3) N			X		X
JPN	321	**Japanese Literature.** (3) N		X			X
LIA	171H	**The Human Event.** (3) F, S	X			X	X
	172H	**The Human Event.** (3) F, S	X			X	X
PHI	111	**Introduction to Moral and Social Philosophy.** (3) F, S, SS			X		X
	301	**History of Ancient Philosophy.** (3) F			X		X
	302	**History of Modern Philosophy.** (3) S			X		X
	311	**Philosophy in Literature.** (3) A			X		X
	332	**19th Century Philosophy.** (3) N			X		X
	401	**Rationalism.** (3) N			X		X
	402	**Empiricism.** (3) N			X		X
POS	101	**Political Ideologies.** (3) F, S				X	X
	440	**History of Political Philosophy I.** (3) A			X		X
	441	**History of Political Philosophy II.** (3) A			X		X
	442	**American Political Thought.** (3) A			X		X
	445	**Asian Political Thought.** (3) A				X	X
	477	**International Political Economy.** (3) A				X	X
REL	210	**Introduction to Judaism.** (3) A	X		X		X
	270	**Introduction to Christianity.** (3) A			X		X
	315	**Hebrew Bible (Old Testament).** (3) A		X	X		X
	316	**Types of Early Judaism.** (3) A			X		X
	317	**Introduction to Rabbinic Judaism.** (3) A			X		X
	320	**Religion in America.** (3) F, S			X		X
	321	**Religion in America.** (3) F, S			X		X
	331	**History of Native American Religious Traditions.** (3) N		X	X		X
	340	**Confucianism and Taoism.** (3) A		X	X		X
	350	**Hinduism.** (3) A		X	X		X
	365	**Islamic Civilization.** (3) A			X	X	X
	372	**Formation of the Christian Tradition.** (3) A			X		X
	374	**Classics of Christian Literature.** (3) N			X		X
	410	**Judaism in Modern Times.** (3) N			X		X
	415	**The Jewish Mystical Tradition.** (3) A			X		X
	420	**Religion in American Life and Thought.** (3) A			X		X
	426	**American Preachers and Preaching: The Sermon in America.** (3) N			X		X
	427	**American Religious Thought.** (3) N			X		X
	444	**Religion in Japan.** (3) A			X		X
	454	**Hindu Religious Thought.** (3) A		X	X		X
	470	**Religion in the Middle Ages.** (3) A			X		X

			L1	L2	HU	SB	H
	471	Reformation and Modern Christianity. (3) A			X		X
RUS	321	Survey of Russian Literature. (3) F, S		X		X	X
	322	Survey of Russian Literature. (3) F, S		X		X	X
	323	Survey of Soviet Literature. (3) F, S		X		X	X
	420	Russian Poetry. (3) N		X		X	X
	421	Pushkin. (3) N		X		X	X
	423	Dostoyevsky. (3) N		X		X	X
	424	Tolstoy. (3) N		X		X	X
	425	Chekhov. (3) N		X		X	X
	426	Soviet Dissident Literature (1917-Present). (3) N		X		X	X
	430	Russian Short Story. (3) N		X		X	X
	441	Survey of Russian Culture. (3) N		X		X	X
SOC	305	Courtship and Marriage. (3) F, S, SS				X	X
	341	Modern Social Problems. (3) F, S, SS				X	X
	352	Social Change. (3) F, S				X	X
	417	Family Violence. (3) F, S				X	X
	440	Racial and Ethnic Minorities. (3) F, S, SS				X	X
	446	Sociology of Crime. (3) F				X	X
	454	The Afro-American in Modern Society. (3) S		X		X	X
	455	Collective Behavior. (3) S				X	X
	456	Political Sociology. (3) S				X	X
	483	History of Social Thought. (3) S, SS				X	X
SPA	472	Spanish-American Civilization. (3) F				X	X
TXC	424	History of Costume. (3) F, S				X	X
WST	100	Women and Society. (3) F, S				X	X

COLLEGE OF PUBLIC PROGRAMS

MCO	314	History of Communications. (3) F, S				X	X

Historical Awareness Courses (H)
Courses Not Concurrently Satisfying a Core Area Requirement

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN

APH	300	World Architecture I/Western Cultures. (3) F
	301	World Architecture II/Eastern Cultures. (3) S
	314	History of Western Architecture II. (3) S
DSC	217	History of Interior Design II. (3) S
PLA	310	History of Landscape Architecture. (3) N
PUP	412	History of the City. (3) N

COLLEGE OF FINE ARTS

ARA	202	Introduction to Photo Aesthetics. (3) F, S
MHL	352	The Evolution of Jazz. (3) F

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

CON	453	Construction Labor Management. (3) F, S

COLLEGE OF LIBERAL ARTS AND SCIENCES

ASB	331	Old World Prehistory I. (3) F
	332	Old World Prehistory II. (3) S
	337	Prehispanic Civilization of Middle America. (3) S
	338	Archaeology of North America. (3) N
ASM	343	Primatology. (3) F
	344	Fossil Hominids. (3) N
	345	Disease and Human Evolution. (3) F
	346	Human Origins. (3) S
HUM	498	Interpretation of Culture. (3) A
JPN	414	Introduction to Classical Japanese. (3) S
REL	310	Western Religious Traditions. (3) A

SCHOOL OF SOCIAL WORK

SWU	331	Social Policy and Services I. (3) F, S

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 40) 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 complete a Health History Questionnaire, available at Student Health, in order to receive services at the Student Health Center.

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.

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. 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.

Programs of Study and procedural information are available from the Graduation Office, Student Services Building, Room 113, or any Registrar's Site.

Application for Graduation Requirements. The following steps are required to complete the graduation process:

1. Register for your final semester.
2. Apply for graduation. Pay graduation fee at the University Cashier's Office. Note deadline date listed in University Calendar.
3. Submit the fee receipt to the Graduation Office, Student Services Building, Room 113D. Your program of study will be reviewed at this time and your graduation date and eligibility to graduate will be verified.

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.

First-Year Composition Requirement. ENG 101 and 102 (or ENG 105) are required for graduation from Arizona State University in any baccalaureate program (see page 33). International students from non-English speaking countries may meet the First-Year Composition requirement by taking ENG 107 and 108 in place of ENG 101 and 102.

Transfer students from other Arizona colleges or universities can determine the acceptability of their composition courses by referring to the most recent Arizona Commission for Postsecondary Education *Course Equivalency Guide*. Composition courses transferred from out-of-state institutions must be evaluated in the First-Year Composition Office. The transfer student must file a Petition for Adjustment of Freshman English Requirements, along with a transcript and catalog descriptions of the composition courses to be transferred. The Petition, available in the First-Year Composition Office, should be filed immediately so that the student will 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 annually. Department, college and university requirements may change and often are upgraded. In determining graduation requirements, a student may use only one catalog.

1. Students who have been in continuous attendance at ASU will usually follow the degree requirements specified in the ASU catalog in effect at the time they registered for their first fall or spring semester at ASU. They may also choose to follow any subsequent catalog while remaining in continuous attendance. Continuous attendance is defined by enrollment in fall and spring semesters, not summer sessions.
2. Students who attend an Arizona community college and transfer to ASU without a break in attendance may elect to use the catalog in effect at the time of their first enrollment at the community college.
3. A student who has been readmitted after a period of nonattendance, or after attending an institution other than ASU or an Arizona community college, will graduate under the requirements for graduation as stated in the catalog at the time of readmission.
4. Students who complete one undergraduate degree program at ASU, are readmitted into a second undergraduate degree program, and attend the next semester do not maintain the catalog year under which they graduated with the first degree. These students must meet the catalog requirements in effect at the time they begin work toward the second degree.
5. Summer registration does not apply in determining catalog requirements.
6. Unclassified students who apply for admission to a degree program will be permitted to follow the catalog requirements in effect at the time they first attended ASU, unless they first attended during a summer session.
7. Correspondence courses do not affect catalog determination. Students who are registered for only a correspondence course for a semester do not maintain their prior catalog year.
8. There is no exception in the application of these guidelines for disqualified students. A student who is disqualified and attends an Arizona community college the next semester remains in continuous attendance. A disqualified student who does not attend ASU or an Arizona community college for one or more semesters falls under the catalog in effect at the time of readmission to ASU.

Inquiries about these guidelines may be directed to the Graduation Office, 602/965-3256.

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.

All petitions must originate with the student's advisor. See pages 67-68 for university degree requirements. See the college sections of this *Catalog* for college and department requirements.

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 after conferral of the first baccalaureate degree 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, 3030 N. Central Avenue, Suite 1400, Phoenix, Arizona 85012, 602/255-4082, or Dr. Brice W. Corder, Assistant Dean, College of Liberal Arts and Sciences, SS 107, 602/965-2365.

Student Services: The Campus Ecology

The university is committed to the belief that an education involves more than attending classes. While the assimilation of information is a central part of the university experience, learning about others, about independence and leadership, and about moving and living in a complex society are equally important. This view is reflected in the eleven areas of Student Affairs and in the service and developmental programs offered by each.

Undergraduate Admissions

For many undergraduates, the first introduction to Arizona State University is through the recruitment and admission programs of Undergraduate Admissions. This office works with high schools and community colleges to provide information about the academic programs and support services available at ASU. Information is provided on admission requirements, policies and procedures. Orientation programs are conducted to ease the student's (and parents') transition to the ASU campus. This office also coordinates and supports the ASU Parents' Association. (For additional information call 602/965-3251.)

Student Financial Assistance

Approximately two-thirds of the full-time students at ASU rely on some form of financial assistance to meet their educational expenses. The purpose of Student Financial Assistance is to review, award and disburse financial resources from a variety of private, federal and institutional sources. Information about, and applications for, scholarships, grants, loans and student employment are coordinated by this office.

Computerization and an understanding of students' needs have contributed to the efficient and responsive operation of this student resource. Assistance in student loan counseling and debt management services are innovative programs offered through this agency. ASU is nationally recognized for providing this unique financial aid service. (For additional information call 602/965-3355.)

Registrar

Management of the registration system and maintenance of academic records are the primary responsibilities of the registrar. An on-line registration system, accessed at any of five Registrar Sites, four located strategically around the campus and one on the ASU West Campus, eases the enrollment process and makes ASU a national leader in the use of computerized registration. The Student Information System stores academic records and improves the quality of data used in academic advising. Coordinated through this office are applications for graduation and undergraduate readmission, course changes and scheduling, veteran certification for educational benefits, transcript services, dispersion of student identification cards and applications for residency and verification of enrollment. (For additional information call 602/965-3175.)

Residence Life

Arizona State University has on-campus residential facilities for approximately 5,700 students. Housing arrangements include non-coed residences, coed residences and facilities used by the majority of the 22 fraternities and 13 sororities which comprise the Greek System. Residence Life strives to provide a safe, clean, economical and convenient living environment and to implement a comprehensive student development program.

There is a variety of room plans available. Choices of facilities range from small group housing to high-rise living. Suite arrangements including single, double and triple rooms; apartments; 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 strengthened through a variety of activities designed to meet the emotional, intellectual, social, physical and career needs of the individual. In addition, opportunities for leadership through the Residence Hall Association, Interfraternity Council and Panhellenic Council are fostered in this community lifestyle.

Skilled professionals and paraprofessional staff living in the residence halls are trained to implement these activities. Residence hall directors, their assistants and peer advisors are available to help individual students receive necessary education and support in residential living. They also strive to facilitate development of a sense of community within the living groups.

Residence hall application information may be obtained from the Residence Life Office. Students are *strongly encouraged to apply early*–at least six months in advance. Demand for on-campus housing exceeds supply. While students must be admitted to the university to live in a residence hall, applications are accepted prior to official admission to the university. Actual assignment will not be made, however, until a student is officially admitted to the university. Residence hall assignments are made based upon the date of receipt in the Residence Life Office of the completed application and a deposit. Application materials contain the Residence Life License Agreement and a description of residence hall meal service options. Requests for specially modified rooms for disabled students should be noted on the application. (For additional information call 602/965-3515.)

Educational Development

Educational Development consists of four programs dedicated to meeting the educational and personal developmental needs of students whose backgrounds require special attention in order to meet and overcome the academic challenges they face. The **Educational Opportunity Center** is a community outreach service which focuses on low-income individuals. The center has a main office in south Phoenix and satellite offices around Maricopa County. It offers vocational testing and guidance, as well as assistance in application for admission and financial assistance at a post-secondary institution suited to particular individuals' needs. Services are free. (For additional information call 602/268-0657.)

The Disabled Student Resource Office provides a broad range of support services which include academic, career and personal counseling; orientation and mobility for the blind; campus orientation, assistance with registration, financial aid and housing. In addition, the following academic support services are provided as appropriate: readers, interpreter/notetakers, library research aides, test accommodations (proctors, scribes, readers) and assistance with adapting course work materials.

Disabled Student Resource houses the Access Learning Lab which helps students develop individualized strategies for mathematics, writing, study skills and time management. The Lab coordinates closely with other campus resources such as the Writing Center, the Math Center and the Educational Support Services Tutoring Center. An Adapted Computer Lab with many of the latest high technology devices for persons with disabilities is also available. An intra-campus cart transportation system and an off-campus van are available for academic and medical needs. Adapted recreational facilities and physical education classes are provided for students with disabilities through the Recreation and Physical Education Departments. Students are fully integrated into campus life and all activities. (For additional information call 602/965-1234 [TTY].)

The Upward Bound Program works with eligible high school students and recent high school graduates to provide the academic foundation for success in the college environment. (For additional information call 602/965-6483.)

Veterans Upward Bound directs its efforts to identify veterans who have not completed their secondary education or are not pursuing a post-secondary education because of inadequate preparation and motivation. GED and college preparatory classes in the basic subject areas are available for veterans who need special instruction. Interest inventory assessments plus career advisement are also available. (For additional information on any of these programs call 602/965-3944.)

Student Life

Working closely with a variety of student populations, the Office of Student Life strives to enrich the overall student experience at ASU. Opportunities for leadership and community involvement help students prepare for their roles as responsible citizens, Through their involvement in student activities and student governance, students learn the qualities of democratic leadership.

The special needs of such nontraditional populations as international students, commuter students,

and adult re-entry students are also concerns of the Student Life Office. Other programs and service areas include student leadership, REACH (Research, Educate, Advise, Counsel and Help), ASU Student Foundation, the Cultural Diversity Program, Understanding the University Experience (Hispanic Mother/Daughter Program) registration of student organizations, student conduct, and exit interviews.

Student organizations offer all students the opportunity to participate in leadership experiences and to explore areas of specific interest to them. Students are encouraged to consider the values of membership in an organization or group of their choice. 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 Student Life Office or by calling 602/965-6547.

The Office of 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. (For additional information call 602/965-6547.)

Counseling and Consultation

Counseling and Consultation provides confidential psychological counseling services for all ASU students. The psychologists and counselors on the staff help students with almost any type of psychological problem, from the sadness of ending a love relationship to more serious mental health problems. The staff is particularly committed to helping minority students and non-traditional students adjust to campus life.

Counseling and Consultation has counseling groups for career exploration, relationship difficulties, stress management, depression, assertiveness, eating disorders, family problems and other common student issues. Individual therapy and couples counseling are available, but are limited to a maximum of twelve sessions. Counseling and Consultation also provides 24-hour emergency counseling to help students in emotional crisis.

Students and non-students may take career interest tests. Other services available to the ASU community include consultation services to faculty and staff, outreach, academic instruction, research and advanced clinical training for graduate students.

Students may schedule an initial counseling appointment either by phone (602/965-6146) or in person.

Student Health

Services. Student Health offers fully accredited outpatient health care to all students enrolled at ASU. The professional staff, consisting of physicians, nurse practitioners, registered nurses, psychiatrists and educators, has special interest and training in college health care. Consultant physicians in dermatology, gynecology, neurology, orthopedics and ear, nose and throat are also available upon referral by a member of this professional staff.

Additional services include the Extended Gynecology Clinic offering comprehensive women's health care and an Allergy Clinic for students needing periodic injections. X-ray and laboratory services are also available to perform most diagnostic procedures. Many prescription and over-the-counter medications are available at the Student Health pharmacy.

Health Education. Health Education focuses on community health education, wellness promotion and illness prevention. A wide variety of seminars, workshops, discussions, lectures and activities are conducted both at Student Health and various locations throughout the campus.

Hours. Student Health is open Monday through Friday all year. During the academic year, some services are also available in the evening and on Saturday. Making an appointment is strongly encouraged to minimize waiting time and allow students the opportunity to establish a relationship with one clinician. Appointments are available by calling 965-3349. Patients with immediate health care problems can be seen without an appointment in the Urgent Care Clinic.

Fees. Full-time students are not charged for most visits at Student Health. Part-time students are charged semester eligibility fees or visit fees. Charges are generated for x-rays and laboratory services, certain special procedures and medications. Patients receiving medical treatment off-campus (consultations, emergency care, hospitalization, etc.) are financially responsible for any resulting charges.

Insurance. Although medical insurance is not required for students to be seen at Student Health, coverage is strongly recommended for all students and is required for international students. Students without health insurance coverage may enroll in the policy made available by ASU during registration or through the Insurance Office at Student Health. Dependents are also eligible for this medical insurance coverage although they are not eligible for treatment at the Student Health Center. This policy

assists students in paying for laboratory and x-ray procedures, off-campus consultations, hospitalization, surgery, emergency and after-hours care.

Student Publications

The activities of Student Publications are most visible in the *State Press*. This campus newspaper, the eighth largest daily newspaper in Arizona, is published five days a week by ASU students who make editorial decisions with the support of an experienced university staff director.

The *State Press* provides students with on-the-job training in news writing, photography, editing, advertising and production work. The *State Press* also addresses the many informational needs of the university community, not only through stories about campus and local/national events, but through paid advertisements by area merchants, campus groups and university faculty, students and staff.

In addition to the *State Press*, Student Publications publishes the *Sun Devil Spark Yearbook* each May. The yearbook is published by a team of more than 55 student editors, writers, photographers and marketing people. The *Spark* is a comprehensive history book encompassing every aspect of campus life and is available to students, staff and the general public for $25 per copy during the fall semester.

Student Publications publishes an annual literary journal entitled *Hayden's Ferry Review* and the annual Student Handbook and Calendar. *Hayden's Ferry Review* includes fiction, poetry, photography and illustrations submitted from people throughout the country.

The Student Handbook and Calendar is produced by student editors, writers and photographers. It serves as an ASU guidebook, answering the questions most often asked by new and continuing students.

Student Publications provides typesetting and composition services to the university community. (For additional information call 602/965-5937.)

Memorial Union

The Memorial Union is a major center of campus activity. The Union serves thousands of students, faculty and staff, as well as many daily campus visitors.

Diversified dining for individual and group needs, the university information desk, a lost and found department, student lounges (both TV and study), an art gallery, card and gift shop, reserved meeting rooms, catering services, credit union, photo shop, conference services, ballroom, bowling, billiards and amusement games, and the Memorial Union Activities Board are all found in the MU. Eight student committees serve advisory and program development functions for the Memorial Union. The MU, in turn, provides opportunities for students to contribute to their community and develop leadership skills. The facility meets the needs of many diverse student populations. (For additional information call 602/965-5728.)

Career Services

Career Services provides advisement for individual career planning concerns and offers information about numerous career fields and permanent positions. Students are encouraged to utilize the Career Development Center throughout their academic careers where computerized career planning systems, published resources and position listings are available to assist them in evaluating and making career choices. Hundreds of employers from business, industry, government and social service agencies, health organizations and school districts come to ASU to interview students seeking permanent or career-related part-time/summer employment. Career Services schedules these interviews and screens both employers and students to meet each group's needs and interests. The office also helps students prepare for interviews and keeps placement files for both students and alumni. Workshops and classroom presentations on career planning, interviewing skills and resume writing are offered. Current job listings are maintained and published on a regular basis throughout the year. Career Services recommends students register at least two semesters before graduating to fully participate in employment placement activities. (For additional information call 602/965-2350.)

Veterans Affairs

This office is a complete educational service center for U.S. veterans and their eligible dependents. Counseling is available regarding admissions, registration and veterans benefits. Veterans programs provide service 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. (For additional information call 602/965-7725.)

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 Affairs Office is located in Student Services Building, Room 117. (For additional information call 602/965-7723.)

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 and Sciences 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.

Minority Student Recruitment Services (MSRS)

Arizona State University is committed to the active recruitment of all underrepresented ethnic minorities. The goal of MSRS is to identify, inform, motivate, recruit and enroll minority students at Arizona State University. Personal contact through high school and community college visits, ASU on-campus visits, mail, phone follow-up and the award of a limited number of need-based scholarships are just some of the approaches used in this recruitment effort. Assistance in the completion of applications for admission, on-campus housing and financial aid is available. Information about university orientation programs, registration and referrals to other ASU student support services is also offered. (For additional information call 602/965-3040.)

Other Opportunities for Student Involvement

Associated Students (ASASU). The Associated Students of Arizona State University (ASASU) is the student government for the university. 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, Graduate Student Association, Faculty Course Evaluation Program, Minority Affairs Board, Rideshare, Lecture Series, Tenants and Commuter Students Association, Association Graphics and Advertising, Bike Co-op, Leadership Institute, Political Union, Homecoming, Club Sports, Public Relations, State Relations, Book Exchange, Safety Escort Service, Student Counseling and Consultation Advocacy Committee, Student Health Advisory Committee, Insuring Tomorrow Leadership Program, College Councils, the Student Senate, the Executive Committee, Intramurals and Recreation (including 60 intramural sports for men and women) and Student Legal Services.

Student Organizations

Fraternities and Sororities. Thirteen sororities and 22 fraternities offer a range of opportunities for interested students. Programs are coordinated by the Interfraternity Council and Panhellenic Council to foster communication between chapters, reward scholastic achievement, and promote university and community service projects. For more information call 602/965-1531.

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 groups are available near the campus 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, Division 1 and the Pacific Athletic Conference (PAC 10). 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 Intercollegiate Athletics and coordinated with Student Financial Assistance.

The University Honors Program

Ted Humphrey, Ph.D.
Director

Nature and Goals

The University Honors Program provides talented and motivated students with educational opportunities designed to further their individual academic and career goals. The program has been developed to provide the benefits characteristic of a small college atmosphere and the resources of a large urban university. Students admitted to the University Honors Program are exposed to highly creative teaching faculty who nurture intellectual pursuits unique to the individual student's abilities and interests. Such faculty bring to undergraduate teaching the expertise of their own thorough education and the excitement of nationally recognized research.

Through the University Honors Program, students can pursue an undergraduate degree in any major normally available at the university. The first two years of the honors curriculum are devoted to general studies, while the last two years focus on studies related to each student's major. Participation in the program offers students the opportunity of writing an honors thesis or working on some other appropriate project during the senior year. Students not only find these projects challenging and personally fulfilling but also valuable for developing talents and interests used after leaving the university.

Benefits

- honors courses are generally limited to enrollments of 22.
- Honors students receive priority at early registration.
- Honors study space is set aside in Hayden Library.
- Honors advisors help students arrange challenging, personalized programs of study.
- Completion of all work in the University Honors Program is recognized on student transcripts, including individual courses, completion of lower-division requirements and graduation from the program. All honors work counts toward graduation, even if students leave the program. Graduates from the program normally receive special consideration for admission to graduate schools and when applying for jobs.

Admission

Entering freshmen are eligible for admission to the program if they are in the top 5% of their high school graduating class, or have either an ACT composite score of 27 or an SAT combined score of 1250, or can submit similar indications of academic aptitude.

Continuing and transfer students who have completed at least 15 semester hours of study with at least a 3.25 cumulative GPA are eligible for admission to the program.

Students not meeting these requirements but who believe they can meet the program's academic standards may apply for provisional admission.

Students with a 3.25 GPA who are not members of the program may enroll in any of its courses.

Retention

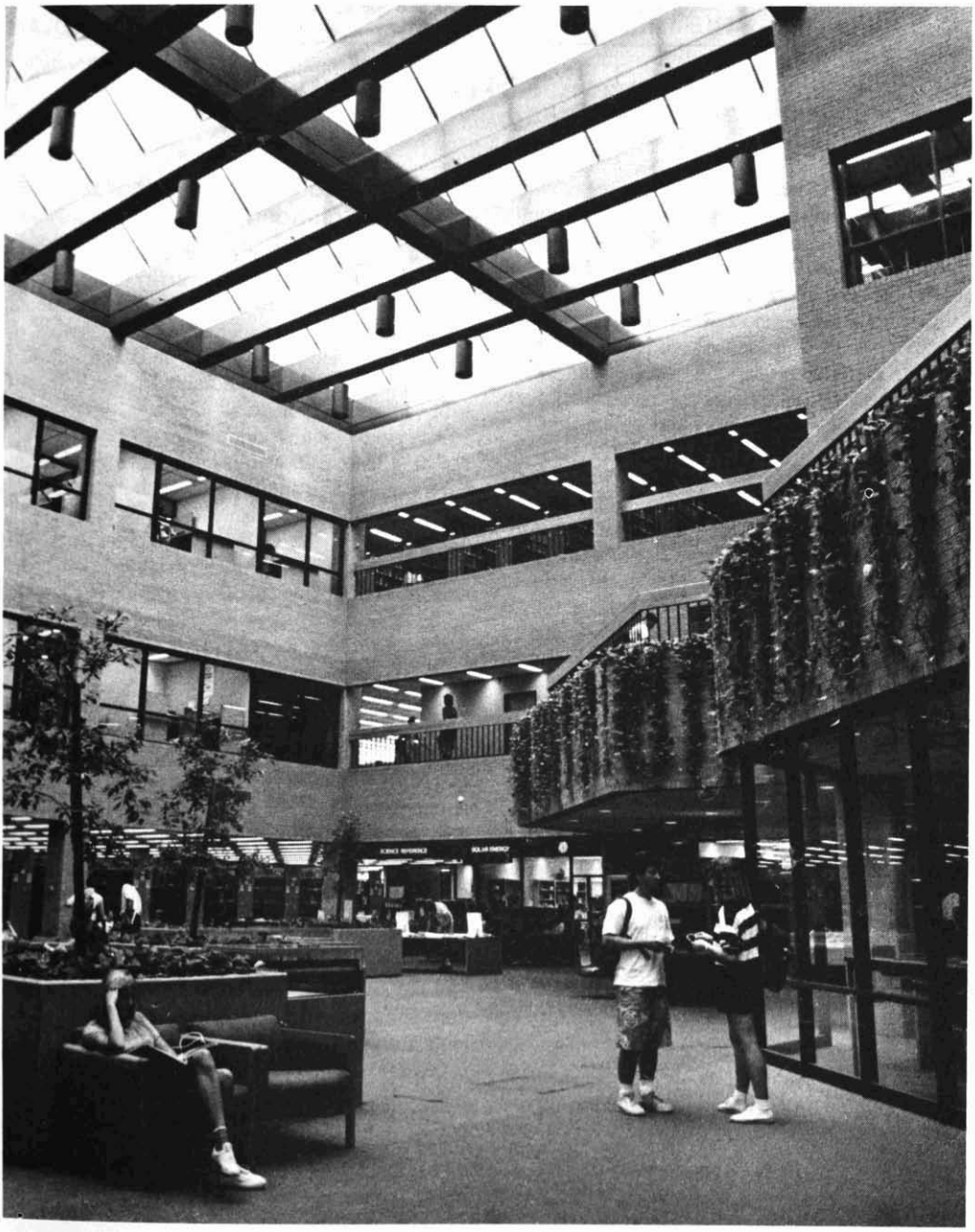
Honors students must maintain high standards of academic performance and show progress toward satisfying the requirements for graduation from the program. Members of the program will normally register for at least one honors course each semester. Students whose cumulative GPA falls below 3.25 will be placed on probation and will be withdrawn from the program if they do not make reasonable progress in raising their cumulative GPA.

Transcript Recognition

Lower Division. Students completing lower-division (first 54 semester hours) work with (1) a 3.40 cumulative GPA and (2) 18 semester hours of honors courses that meet general studies requirements and normally include ENG 105 and LIA 171-172, may have the following notation placed on their

official transcript: "Completed lower division work with honors."

Graduation from the Program. Students completing upper division work with (1) a 3.40 cumulative GPA, (2) 18 semester hours of upper division honors work with a grade of "B" or better, and (3) a successfully defended honors thesis or project will graduate from the University Honors Program. The 18 semester hours of upper-division work must include at least 6 semester hours of honors courses outside the major and may include up to 6 semester hours credit for the honors thesis or project, including any one preparatory research methods course. Graduation with honors requires that a student meet all other requirements for graduation from the university.



College of Liberal Arts and Sciences

Samuel A. Kirkpatrick, Ph.D.
Dean

The College of Liberal Arts and Sciences provides an essential balance between a broad education in the natural sciences, social sciences and humanities, and a deeper specialization in one or more fields of knowledge. The interests of the college include the preservation, transmission and expansion of knowledge. At the core of these interests lies the intent of fostering continuous learning and freedom of inquiry, necessary ingredients for personal growth and for achievement in both the public and the private sectors.

The College of Liberal Arts and Sciences consists of 21 academic departments, several interdisciplinary programs, 6 centers and several research institutes and laboratories. There are 33 programs leading to either a Bachelor of Science or a Bachelor of Arts degree. There are also 25 programs leading to a Master of Arts or Master of Science degree and 14 programs leading to a Doctor of Philosophy degree as well as interdisciplinary graduate programs in cooperation with other colleges.

The interplay of quality teaching, research and service is part of the mission of the college to provide an outstanding undergraduate education. The college has a commitment to undergraduate excellence in a variety of ways, including active participation in the Honors Program and comprehensive advisement services related to diverse career patterns or preparation for graduate education and a wide range of professional careers, such as law or medicine.

In addition to caring for its own majors, the college provides the foundations of learning in several core areas for the other undergraduate colleges. In more ways than one, the college stands at the heart of undergraduate education in the university.

Admission to College of Liberal Arts and Sciences

Any student who has met the minimum requirements for admission to the university (see pages 22-27) and who wishes to major in a subject offered within the College of Liberal Arts and Sciences, or who is undecided about a major and has fewer than 60 semester hours, will be admitted to the College of Liberal Arts and Sciences.

Any student with a cumulative grade point average of at least 2.00 who is currently registered (in good standing) in another college at Arizona State University and who wishes to major in a subject offered within the College of Liberal Arts and Sciences and follow a program of study in the major may transfer into the college by making application in the Office of Student Academic Affairs, Social Science Building, Room 111.

Transfer Students

The university standards for evaluation of transfer credit are listed under undergraduate admissions (page 26). Transfer students are urged to contact the relevant academic department or the Office of Student Academic Affairs, Social Science 111, to ensure a smooth transition to the College of Liberal Arts and Sciences.

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 67).

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

Minors. Special minors are available in the following departments: Anthropology; Astronomy; English; Foreign Languages (a) Asian Languages (Chinese/Japanese), (b) French, (c) German, (d) Italian, (e) Russian, (f) Spanish; Philosophy; Physics; Political Science; Religious Studies; Sociology; Women's Studies. Please check department program descriptions for details.

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
Family Resources and Human Development	(B.A., B.S.)	Family Resources and Human Development
French	(B.A.)	Foreign Languages
Geography	(B.A., B.S.)	Geography
Geology	(B.S.)	Geology
German	(B.A.)	Foreign Languages
History	(B.A., B.S.)	History
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.)	Spanish
Speech and Hearing Science	(B.S.)	Speech and Hearing Science
Wildlife Biology	(B.S.)	Zoology
Women's Studies	(B.A., B.S.)	Women's Studies Program
Zoology	(B.S.)	Zoology

† The Department of Computer Science is located administratively in the College of Engineering and Applied Sciences. The B.S. with a major in Computer Science is offered by both the College of Liberal Arts and Sciences and the College of Engineering and Applied Sciences. Requirements differ according to college (see page 99 and page 301).

* 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 Sciences and the College of Business. Requirements differ according to college (see page 99 and page 207).

Five-Year Liberal Arts–MBA Plan

A capable and academically well-qualified Liberal Arts and Sciences freshman may, by careful selection of electives, plan a course of study which will lead to the Master of Business Administration degree with only one year of additional study beyond the B.A. or B.S. degree in a Liberal Arts and Sciences subject. For more detailed information, consult an advisor in the Office of Student Academic Affairs, Social Science 111, or telephone 965-6506.

Teacher Certification for Liberal Arts and Sciences

Majors–Secondary Education. A student may obtain a B.A or a B.S. degree in Liberal Arts and Sciences 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 and Sciences. For further information regarding the curriculum or certification the student may consult the Office of Educational Services in Payne Hall (Ed B-7). The curriculum leading to the B.A. in Education is described in this *Catalog* on page 224.

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 and Sciences, Social Science Building 111. An *Academic Advising Guide for Students* is available for students in the advisement office. Students should examine the calendar for enrollment, adding, dropping and withdrawing published in the *Schedule of Classes* for each semester.

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 Sciences, 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
Dentistry*	Pre-Health Professions, SS 107
Foreign Service	Department of chosen major
Health Physics	Pre-Health Professions, SS 107
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 and Sciences 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 Social Science Building 111.

"Undecided" or "Undeclared" Majors. Students in the College of Liberal Arts and Sciences are not required to select a major upon entering 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 located in Social Science 111 or the University Academic Advising Center in Social Science 101. It is important to consult an academic advisor prior to any enrollment activity. During the semester in which they earn 60 semester 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 available both in academic departments and in the Student Academic Affairs Office of the college or the University Academic Advising Center; 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. Important: See Section VII of the college graduation requirements (page 84).

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. First-semester freshmen and entering transfer students are not permitted to register for more than 18 semester hours in their initial semester. Other students who wish to register for more than 18 hours must have an average of at least 3.00 and must file a petition in the Student Academic Affairs Office, Social Science 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 B.A. and B.S. degree curricula are required to present at least 126 semester hours, 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 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 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 and 108 for ENG 101 and 102.

Foreign Language Requirement. The College of Liberal Arts and Sciences 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 28. 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 exami-

nation can be used only to demonstrate proficiency; it does not produce semester 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.

College Graduation Requirements

To graduate from the College of Liberal Arts and Sciences, a student must satisfy requirements of three kinds: (1) proficiency requirements, which indicate a minimal level of competence in communication, quantitative reasoning and foreign language; (2) major requirements, which involve concentrated course work in one field; and (3) distribution requirements, which insure that the student is exposed to disciplines outside the major field.

I. **Proficiency Requirements.** Each student is required to demonstrate proficiency in English, foreign language and mathematics.

Each student must demonstrate proficiency by passing an examination or by completing the courses specified below with a grade of "C" or better in each course. Courses used to meet a proficiency requirement may not ordinarily be used to satisfy the distribution requirement; the two exceptions are specified below under III.A and III.C.

A. English
   1. ENG 101 and 102, or
   2. ENG 105, or
   3. ENG 107 and 108 for foreign students.

B. Foreign Language
   1. Completion of a foreign language at the intermediate level (202 or equivalent), or
   2. A foreign language course at the 300-level or above taught in the foreign language, or
   3. Completion of secondary education at a school in which the language of instruction is not English.

C. Mathematics
   1. MAT 115 or 117, or
   2. Any MAT course for which MAT 115 or 117 is a prerequisite.

II. **Major Requirements.** Each student is required to select a major from among the fields of study offered by the College of Liberal Arts and Sciences. The requirements for completion of the major are described under departmental listings.

A. The major department may require up to 45 semester hours of course work. A maximum of 18 additional hours may be required in related courses and prerequisites. No more than 63 semester hours of course work may be required to complete the major, related courses and prerequisites. Additionally, three college algebra credits (MAT 115 or MAT 117), if required for natural sciences or mathematics majors, are not included in the 63 hours limit. Some departments require calculus-level mathematics; up to 5 of these hours may be excluded from the 63-hour maximum because they satisfy the mathematics proficiency requirement.

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

C. Major fields of study are classified into the following divisions:

Humanities and Fine Arts

Asian Languages (Chinese/Japanese)
English
French
German
Humanities
Italian
Philosophy
Religious Studies
Russian
Spanish

Social and Behavioral Sciences

Anthropology
Economics
Family Resources and Human Development*
Geography
History
Physical Education*
Political Science
Psychology
Sociology
Speech and Hearing Science*
Women's Studies*

* Students majoring in these fields must satisfy the distribution requirements in all three divisions.

Natural Sciences and Mathematics
Biology
Botany
Chemistry
Clinical Laboratory Sciences
Computer Science
Geology
Mathematics
Microbiology
Physics
Wildlife Biology
Zoology

In addition, the Departments of Aerospace Studies and Military Science offer programs leading to commissions in the armed forces, but they do not offer majors.

D. Interdisciplinary Studies Major. For students who wish to pursue a coherent course of study involving more than one department, an interdisciplinary studies major is available.

Admission requirements: Completion of 32 semester hours with a grade point average of at least 3.00 and three letters of recommendation from ASU faculty members. Degree requirements include:

1. 18-30 semester hours to meet the core requirements in one discipline,
2. 15-27 semester hours that complement the disciplinary core, and
3. 6 semester hours of thesis. For information, contact the Office of Student Academic Affairs, Social Science 111.

III. Distribution Requirements. The purpose of the distribution requirement is to insure that the student is introduced to a methodology outside the division of the major.

Major fields are classified according to division as humanities, social and behavioral sciences, and natural sciences and mathematics. A list of major fields is given above under II.C.

Unless the major field is starred in II.C, students will be considered to have fulfilled the distribution requirement in the division of the major.

Starred major fields: Students majoring in Family Resources and Human Development, Physical Education, Speech and Hearing Science, and Women's Studies must satisfy distribution requirements in social and behavioral sciences as well as in the other two divisions.

Cross-listed Departments: Students majoring in cross-listed departments (Anthropology, Geography and Psychology) may not use ASM courses in the case of Anthropology majors, GPH courses in the case of Geography majors, or PSY courses in the case of Psychology majors to satisfy the natural sciences and mathematics requirements, nor may respective majors count ASM, GPH or PSY courses toward the social and behavioral sciences distribution requirements.

A. Humanities and Fine Arts (15 semester hours). Each student is required to complete five courses of at least three semester hours each. Course prefixes are identified below.

At least three of the five courses must be taken in the Departments of English, Foreign Languages, Philosophy and Religious Studies. Two of these must be at the 300-level or above.

Exception: Literature or "civilization" courses (300-level or above) taught in a foreign language may be used to satisfy the humanities distribution requirement, even if they are also used to demonstrate foreign language proficiency.

Course prefixes for the humanities distribution requirement:

- ENG, HUM (English Department: Any course except ENG 101, 102, 105, 107, 108)
- CHI, FLA, FRE, GER, GRK, ITA, JPN, LAT, POR, RUS, SPA (Foreign Language Department: FLA 150 or any literature or "civilization" course at the 300-level or above)
- PHI (Philosophy Department)
- REL (Religious Studies Program)
- APH (College of Architecture and Environmental Design)
- ARS, DAH, MHL, MUS, THE (College of Fine Arts)

B. Social and Behavioral Sciences (15 semester hours). Each student is required to complete five courses of at least three semester hours each.

Courses used to fulfill the social and behavioral sciences distribution requirement must be taken from at least two departments, but from no more than three departments.

At least two courses must be at the 300-level or above.

Course prefixes for the social and behavioral sciences distribution requirement:

- ASB (Anthropology Department)
- ECN (Economics Department, College of Business)
- GCU (Geography Department)
- HIS (History Department)
- POS (Political Science Department)
- PGS (Psychology Department)
- SOC (Sociology Department)
- WST (Women's Studies Department, WST 100 only)

C. Natural Sciences and Mathematics (14 semester hours)

Part A–(8 semester hours). Two courses (either lecture courses with an included laboratory, or lecture courses with appropriate accompanying laboratory) to be taken in the Departments of Botany, Chemistry, Microbiology, Physics or Zoology. See departmental listings.

Part B–(6 semester hours). Two courses to be taken from the Departments of Anthropology (ASM only), Botany, Chemistry, Computer Science, Geography (GPH only), Geology, Mathematics, Microbiology, Physics, Psychology (PSY only) or Zoology. See departmental listings. Students who completed Part A using courses from only one department may not use courses from that department in Part B.

Exception: Only mathematics courses for which MAT 115 or 117 or a higher-level mathematics course is a prerequisite can be used to satisfy natural sciences and mathematics distribution requirement. mathematics courses for which MAT 115 or 117 is a prerequisite may be used to satisfy distribution requirement in natural sciences and mathematics, even if they were also used to demonstrate mathematics proficiency.

IV. Transfer Students. Transfer students should contact their major department, the College of Liberal Arts and Sciences, the Office of Student Academic Affairs (Social Science 111) or the University Academic Advising Center (Social Science 101), to plan their courses of study.

V. University General Studies Requirements. A well-planned program of study will enable students to articulate university General Studies requirements with the College of Liberal Arts and Sciences graduation requirements. General Studies courses are regularly reviewed. To determine whether a course meets one or more General Studies course credit requirements, see the listing of courses by core and awareness area, pages 45-66. General Studies courses are also identified following course descriptions according to the following key:

Key to General Studies Credit Abbreviations

L1	Literacy and Critical Inquiry Core Courses (Intermediate level)
L2	Literacy and Critical Inquiry Core Courses (Upper division)
N1	Numeracy Core Courses (Mathematics)
N2	Numeracy Core Courses (Statistics and Quantitative Reasoning)
N3	Numeracy Core Courses (Computer Applications)
HU	Humanities and Fine Arts Core Courses
SB	Social and Behavioral Science Core Courses
S1	Natural Science Core Courses (Introductory)
S2	Natural Science Core Courses (Additional Courses)
G	Global Awareness Courses
H	Historical Awareness Courses

VI. General Electives. In addition to meeting university General Studies and college graduation requirements, the remainder of the minimum of 126 hours required for graduation are general electives that may be selected from any of the departments of the College of Liberal Arts and Sciences and from the offerings of other colleges.

VII. Program of Study. The program of study, which is required by university regulations within the semester students earn their 87th hour, must be filed and approved at least two weeks prior to the pre-registration period for the subsequent semester. Students are expected to follow the approved program of study or receive early college approval for proposed changes to the program of study. Students should contact the college Graduation Office, Social Science 111, regarding college graduation rules.

Special Credit Options

All special options including pass/fail and audit need the approval of the instructor and the college and should be completed before the end of drop/add.

Pass/Fail Grade Option

I. The pass/fail option is intended to broaden the education of Liberal Arts and Sciences 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 and Sciences students with 60 semester hours 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 proficiency and distribution requirements of the college or the university General Studies requirement.
   3. A maximum of 12 hours taken for pass/fail may be counted toward graduation.

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

Academic Standards and Retention

The 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 41 of this *Catalog*, except that the disqualified student in the College of Liberal Arts and Sciences is suspended for at least two regular semesters at the university. Disqualified students should contact the Office of Student Academic Affairs, Social Science 111, regarding procedures and guidance for returning to good standing.

Academic discipline is one of the functions of the Office of Student Academic Affairs, Social Science 111. All students who are having academic difficulties of any kind should contact this office. Also available in this office is information on policies and procedures of the college on academic honesty, student grievances with respect to grades, and various petitions regarding college standards and graduation requirements.

Special Programs

Honors Program. The College of Liberal Arts and Sciences provides a full four-year Honors Program for the university. The Honors Program affords superior undergraduates opportunities for enhanced educational experiences in the major field. For a complete description of the Honors Program requirements and opportunities, see the description of the University Honors Program in this *Catalog*, pages 76-77.

Interdisciplinary Studies. An interdisciplinary 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 and focus on specific topics or problem areas. For more information about degree requirements, see Section II.D under the college graduation requirements or contact the Office of Student Academic Affairs in the College of Liberal Arts and Sciences, Social Science 111.

Certificate Programs

Asian Studies. The Center for Asian Studies has developed interdisciplinary programs to prepare both undergraduate and graduate 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. Examples: 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. Fulfillment of requirements will be recognized on the transcript by a bachelor's degree with a major in "(Discipline)–Asian Studies." Contact the director of the Center for Asian Studies for details.

Health Physics. The curriculum of Health Physics involves work in the College of Liberal Arts and Sciences and in the College 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 B.S. 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 B.S. degree in a physical and life science which follows a prescribed program. Inquiries about the program should be addressed to the Pre-Health Professions Office, Social Science 107, where academic advisement is available.

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; and (5) stand as an example of the university's commitment to a program of meaningful ethnic studies on a firm academic base.

The Certificate of Concentration in Jewish Studies may be combined with a major in any college. For information about the program, refer to the Department of History or the Department of Religious Studies.

Latin American Studies. 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, as well as the College of Business. In this program the students major 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 hours in other disciplines. A reading knowledge of Spanish or Portuguese is required.

For detailed information about program requirements, consult the Office of the Center for Latin American Studies, Social Science 213.

Russian and East European Studies. Any undergraduate major can earn a Certificate in Russian and East European Study by successfully completing one of the following options: Option 1: three years of Russian or two years of Russian and one year of another East European language and 30 upper-division semester hours in Russian/East European course work; Option 2: two years of Russian and 26 upper-division hours in Russian/East European course work. Fulfillment of these requirements will be recognized on the transcript by a bachelor's degree with a major in "(Discipline)–Russian/East European Studies."

For further details consult the coordinator of the Russian and East European Consortium, Department of History.

Southeast Asian Studies. Certificate in Southeast Asian Studies is awarded to any undergraduate student who elects an interdisciplinary focus on Southeast Asian Studies while simultaneously completing degree requirements in any college in the university. The curriculum involves completion of 36 hours of course work, including two years of a Southeast Asian language; one required interdisciplinary core course; and several elective social science and humanities courses, covering history, geography, cultures, politics and religions of the region. Further information may be obtained from the Office of the Program for Southeast Asian Studies.

Women's Studies. The curriculum of Women's Studies involves courses from colleges throughout the university. The program is designed to: (1) examine the central issues of the quality and shape of women's lives; (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.

A Certificate of Concentration in Women's Studies will be awarded for the successful completion of either WST 100 or WST 300, plus WST 498 and an additional 15 semester hours from the list of approved Women's Studies courses, only 6 hours of which may also be applied toward the student's major.

Inquiries about the program should be addressed to the Women's Studies Office, Social Science 104, where the current list of approved courses is available.

Research Centers

To expand educational horizons and to enrich curriculum, the College of Liberal Arts and Sciences maintains the following research centers:

Arizona Center for Medieval and Renaissance Studies
Cancer Research Institute
Center for Asian Studies
Center for Latin American Studies
Center for Meteorite Studies
Center for Solid State Science
Hispanic Research Center

See the *Graduate Catalog* of the university for a description of these research centers.

Aerospace Studies

(Air Force ROTC)

PROFESSOR:
CARRIGAN (MAIN 340)
ASSISTANT PROFESSORS:
BUTER, STALEY, SWIGERT

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 semester hours for each AES 100 and 200 class completed; a total of 8 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 a 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 a 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 and the four-week field training 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.

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 an allowance for 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 1 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.

Light Aircraft Training ROTC (LATR). Cadets designated to enter U.S. Air Force Undergraduate Pilot Training after graduation participate in LATR after their junior year in college unless they already have a private pilot's license. Each cadet receives 14 hours of instruction at no expense to the student. This training also includes ground school instruction.

AEROSPACE STUDIES

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

102 Nature of U.S. Air Power. (2) S
Background on strategic missile defense forces, general purpose and aerospace support forces in national defense. 1 lecture, 1 hour Leadership Practical Application.

201 Aerospace History to WWII. (2) F
Historical survey of events, trends, and policies leading to the emergence of air power through WW II. 1 lecture, 1 hour Leadership Practical Application. *[Satisfies General Studies Requirements: SB, H]*

202 Aerospace History: WWII to Present. (2) S
Development of aerospace power from WW II to the present emphasizing the impact of limited war and technology on roles and missions. 1 lecture, 1 hour Leadership Practical Application. *[Satisfies General Studies Requirements: SB, H]*

301 U.S. Air Force Communication Management and Leadership. (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. 2 lectures, 1 hour Leadership Practical Application. *[Satisfies General Studies Requirement: SB]*

302 U.S. Air Force Management and Leadership. (3) S
Organizational and personal values, management of forces in change, organizational power, politics, managerial strategy and tactics. 2 lectures, 1 hour Leadership Practical Application. *[Satisfies General Studies Requirement: SB]*

401 National Security Institutional Policy and Strategy. (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. 2 lectures, 1 hour Leadership Practical Application. *[Satisfies General Studies Requirement: SB]*

402 Topical and Regional Security Issues. (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. 2 lectures, 1 hour Leadership Practical Application. *[Satisfies General Studies Requirement: SB]*

Anthropology

PROFESSORS:
REDMAN (ANTH A-124), BAHR, CLARK, FOSTER, MERBS, MORRIS, NASH, SCHOENWETTER, STARK, TURNER
ASSOCIATE PROFESSORS:
AGUILAR, BRANDT, CHANCE, EDER, FIRESTONE, GAINES, KINTIGH, MARTIN, WILLIAMS
ASSISTANT PROFESSORS:
CARR, HEDLUND, MARZKE, SPIELMAN, STEADMAN
PROFESSORS EMERITI:
DITTERT, RUPPÉ, STEWART

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Anthropology. Consists of 45 semester hours 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) ASB 102 and ASM 101; (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 anthropology 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 81.)

Latin American Studies Combined Degree Program. (See Latin American studies, page 86.) Consists of the B.A. 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 pro-

gram must be approved by the Center for Latin American Studies. Fulfillment of requirements is recognized on the transcript as a B.A. degree with a major in Anthropology–Latin American Studies.

Departmental Minor Requirements

The Anthropology minor requires 18 semester hours. Two courses, ASB 102 and ASM 101, are required. The other 12 hours must be upper division and represent two of the three subfields of anthropology, with two courses in one subfield.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Social Studies: Anthropology. Consists of 63 semester hours, of which 30 hours must be in the anthropology courses required for the B.A. 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, natural sciences or psychology			15
SED	480	Special Methods of Teaching Social Studies	3
Total			63

Departmental Minor Teaching Field Requirements

(Secondary Education)

Anthropology. Consists of 24 semester hours in anthropology. Courses ASB 102, ASM 101, 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 M.A. and Ph.D. degrees. Consult the *Graduate Catalog* for requirements.

ANTHROPOLOGY (ASM)

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. *[Satisfies General Studies Requirements: SB, H]*

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. May be repeated for credit. Prerequisite: instructor approval.

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

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. 3 lectures, 3 hours lab. Prerequisites: ASM 101; MAT 106 or equivalent; or instructor approval. *[Satisfies General Studies Requirement: S2]*

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 instructor approval. *[Satisfies General Studies Requirement: H]*

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 instructor approval. *[Satisfies General Studies Requirement: H]*

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 instructor approval. *[Satisfies General Studies Requirement: H]*

346 Human Origins. (3) S
Humanity's place in nature, fossils, historic and recent concepts of human races, influence of culture on human evolution. *[Satisfies General Studies Requirement: H]*

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. *[Satisfies General Studies Requirement: SB]*

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

435 Archaeological Pollen Analysis. (3) F
Theory, methodology and practice of pollen analytic techniques. Compares uses in botany, geology and archaeology. 2 lectures, 3 hours lab. Possible field trips. Prerequisite: instructor approval.

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. 3 lectures, 3 hours lab. Prerequisite: instructor approval. *[Satisfies General Studies Requirement: S2]*

454 Comparative Primate Anatomy. (4) S
Functional anatomy of the cranial, dental and locomotor apparatus of primates including humans, emphasizing the relation of morphology to behavior and environment. Lectures and lab dissections and demonstrations. 3 lectures, 3 hours lab. Prerequisite: instructor approval.

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. Directed readings and 6 hours lab. Prerequisites: ASM 343†; instructor approval. *[Satisfies General Studies Requirement: L2]*

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; ASB 330; or instructor approval.

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

472 Archaeological Ceramics. (3) N
Analysis and identification of pottery wares, types and varieties. Systems for ceramic classification and cultural interpretation. 2 lectures, 3 hours lab. Prerequisite: instructor approval.

494 Special Topics: Roles in Computer Anthropology. (3) S
[Satisfies General Studies Requirement: N3]

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. 1 lecture, 6 hours lab. Prerequisite: ASM 341† or instructor approval.

565 Computer Archaeology. (3) F
Methods of structuring and codifying archaeological data sets; both management and manipulation techniques stressed. Review of computer applications of archaeological databases. Design of individual research projects utilizing a mainframe computer.

566 Advanced Computer Applications. (3)S
Advanced applications utilize a variety of software packages for managing and manipulating large data sets. Graphic techniques are emphasized as research aids. Prerequisite: ASM 565 or instructor approval.

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
Cross-listed as ASB 591.
(e) Interdepartmental Seminar
Cross-listed as ASB 591.

Special Courses: ASM 294, 298, 394, 484, 492, 493, 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 36-37.)

ANTHROPOLOGY (ASB)

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. *[Satisfies General Studies Requirements: SB, G]*

210 Sex, Marriage and Evolution. (3) F
Examination of the sexual nature and behavior of humans from both a biological and an anthropological point of view.

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. *[Satisfies General Studies Requirement: G]*

222 Buried Cities and Lost Tribes: Our Human Heritage. (3) S
Archaeology through its most important discoveries: Human origins, Pompeii, King Tut, the Holy Land, Southwest Indians and methods of field archaeology. *[Satisfies General Studies Requirement: HU]*

231 Archaeological Field Methods. (4) S
Excavation of archaeological sites and recording and interpretation of data. Includes local field experience. 2 lectures, 8 hours lab. Prerequisite: ASM 101 or instructor approval. *[Satisfies General Studies Requirement: S2]*

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

294 Special Topics: Introduction to Southeast Asia (3) N
[Satisfies General Studies Requirement: G]

311 Principles of Social Anthropology. (3) S
Comparative analysis of domestic groups and economic and political organizations in primitive and peasant societies. *[Satisfies General Studies Requirement: SB]*

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 instructor approval.

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

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 instructor approval. *[Satisfies General Studies Requirements: SB, H]*

322 Indians of Mesoamerica. (3) S
Historic tribes and folk cultures. Prerequisite: ASB 102 or instructor approval. *[Satisfies General Studies Requirement: G]*

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 instructor approval. *[Satisfies General Studies Requirement: G]*

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 instructor approval. *[Satisfies General Studies Requirement: G]*

330 Principles of Archaeology. (3) F
Prehistoric societies. Survey of dating methods, field techniques and artifactual inventories. Geographic, climatic and geological relationships. *[Satisfies General Studies Requirement: SB]*

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 instructor approval. *[Satisfies General Studies Requirement: H]*

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, southwest Europe. Prerequisite: ASM 101 or instructor approval. *[Satisfies General Studies Requirement: H]*

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. *[Satisfies General Studies Requirements: L2, SB, H]*

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 instructor approval. *[Satisfies General Studies Requirement: G]*

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. *[Satisfies General Studies Requirements: SB, H]*

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 instructor approval. *[Satisfies General Studies Requirement: H]*

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 instructor approval. *[Satisfies General Studies Requirement: H]*

350 Anthropology and Art. (3) A
Art forms of people in relationship to their social and cultural setting. Prerequisite: ASB 102 or instructor approval.

351 Psychological Anthropology. (3) S
Approaches to the interrelations between the personality system and the socio-cultural environment. Prerequisite: ASB 102 or instructor approval. *[Satisfies General Studies Requirement: SB]*

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

383 Linguistic Theory: Phonetics and Phonology. (4) F
Basic articulatory phonetics and contemporary theories of the sound system of language. 3 hours lecture, 1 hour lab. *[Satisfies General Studies Requirement: SB]*

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 instructor approval.

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 instructor approval. *[Satisfies General Studies Requirements: L2, SB]*

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 instructor approval.

417 Political Anthropology. (3) A
Comparative examination of the forms and processes of political organization and activity in primitive, peasant and complex societies. Prerequisite: ASB 102 or instructor approval.

426 Historical Archaeology. (3) N
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 instructor approval.

480 Introduction to Linguistics. (3) F
Descriptive and historical linguistics. Survey of theories of human language, emphasizing synchronic linguistics. *[Satisfies General Studies Requirement: SB]*

481 Language and Culture. (3) S
Application of linguistic theories and findings to nonlinguistic aspects of culture; language change; psycholinguistics. Prerequisite: ASB 102 or instructor approval. *[Satisfies General Studies Requirement: SB]*

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 480, ENG 213 or FLA 400; or instructor approval. *[Satisfies General Studies Requirement: SB]*

530 Ecological Anthropology. (3) A
Relations among the population dynamics, social organization, culture and environment of human populations, with special emphasis on hunter-gatherers and extensive agriculturalists.

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. May be repeated for credit. Prerequisites: ASM 338† or equivalent; instructor approval.

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: instructor approval.

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. Seminar and field work. Prerequisites: regular graduate student standing; 12 completed graduate hours in archaeology; instructor approval.

540, 541 Method and Theory of Social and Cultural Anthropology. (3) F, S
Development and theoretical basis of social and cultural anthropology, placed in the context of science in general and social science in particular. Prerequisite: instructor approval.

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

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

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 480, FLA 400 or instructor approval.

583 Linguistic Theory: Phonological Systems. (3) F
Origins and development of contemporary phonological systems with particular attention to non-Western languages. Prerequisite: ASB 480, FLA 400 or instructor approval.

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
Cross-listed as ASM 591.
(j) Interdepartmental Seminar
Cross-listed as ASM 591.

Special Courses: ASB 294, 298, 394, 484, 492, 493, 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 36-37.)

Biological Sciences

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

Bachelor of Science Degree Curriculum

Biology. 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 43 hours and 20 hours in supplementary areas, plus a mathematics proficiency. Required major courses (31 hours) are BIO 181, 182, 320, 340; BOT 300, 360 (or ZOL 360); MIC 205 (or 220), 206; ZOL 350. The remaining 12 hours are to be selected so that the total major hours reflect a balance between the two departments. Required supplementary courses are CHM 113, 115, 231 (or 331, 332, 335, 336); CSC 181 (or 183); MAT 210 (or any calculus); and PHY 101 (or 111, 112, 113, 114).

Bachelor of Arts in Education Degree Curriculum

Departmental Major Teaching Field Requirements

(Secondary Education)

Biological Sciences. The major consists of a minimum of 42 semester hours, plus at least 9 hours in supporting courses. Required major courses are BIO 181, 182, 320, 340; BOT 300 (or 370), 360; MIC 205 (or 220), 206; 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 205 (or 220), 206; and 8 additional hours in courses listed under biology, botany, microbiology and zoology, with the *exception* of the following: BIO 100, 218; BOT 108; ZOL 113, 300, 318. Supporting course: BIO 480 is required in addition to the 24 hours credit in biological sciences.

BIOLOGY

BIO 100 The Living World. (4) F, S
Principles of biology. Cannot be used for major credit in the biological sciences. 3 hours lecture, 3 hours lab. *[Satisfies General Studies Requirements: S1, S2]*

181, 182 General Biology. (4) F, S
Biological concepts emphasizing fundamental principles and the interplay of structure and function at the molecular, cellular, organismal and population levels of organization. 3 hours lecture, 3 hours lab. For majors in biological sciences and preprofessional students in health-related sciences. Prerequisite for 182: BIO 181. Secondary school chemistry strongly recommended. *[Satisfies General Studies Requirement: S1 (181), S2 (181, if not used to satisfy S1); 182]*

217 Introduction to Fisheries and Wildlife Management. (3) F
Management of fisheries and terrestrial wildlife, emphasizing management of ecosystems. Designed for prospective wildlife biologists. Prerequisite: 8 hours of biology.

218 Medical History. (1) F
Brief survey of humankind's important inventions and discoveries in the art and science of medicine, illustrating interrelationships of medical ideas.

300 Natural History of Arizona. (3) F, S
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. 2 weekend field trips and a field project. Cannot be used for major credit in the biological sciences. Pre- or corequisite: BIO 300.

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

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

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. *[Satisfies General Studies Requirement: G]*

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. 3 hours lecture, 1 hour recitation. Prerequisite: BIO 182.

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. 3 hours lecture, 3 hours lab. Prerequisite: MAT 210† or equivalent. *[Satisfies General Studies Requirement: N2]*

420 Computer Applications in Biology. (3) F
Computer analysis techniques in biology emphasizing data entry, management and analysis, and graphic portrayal. Employs mainframe and microcomputers. Prerequisites: BIO 182; MAT 115; or instructor approval. *[Satisfies General Studies Requirement: N3]*

424 Ecosystems. (3) F '89
Structure and function of terrestrial and aquatic ecosystems, with emphasis on productivity, energetics, biogeochemical cycling and systems integration. Prerequisite: BIO 320 or equivalent.

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

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) N
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
Eukaryotic cell functions as effected by intracellular compartmentation. Emphasis on the application of electron microscopic analyses, cell fraction and selected biochemical procedures. Prerequisites: BIO 332 or BOT 360 or ZOL 360 or equivalent; CHM 231 or 331 or equivalent.

435 Biomembranes. (3) N
Structure and function of biological membranes, emphasizing synthesis, fluidity, exocytosis, endocytosis, and cell responses to hormones and neurotransmitters. Prerequisites: BIO 332 or equivalent; CHM 231 or 331 or equivalent.

441 Cytogenetics. (3) F '88
Chromosomal basis of inheritance. Prerequisite: BIO 340†.

442 Cytogenetics Laboratory. (2) F '88
Microscopic analysis of meiosis, mitosis and aberrant cell division. 6 hours lab. Pre- or corequisite: BIO 441†.

443 Molecular Genetics. (3) F
Nature and function of the gene. Prerequisites: BIO 340†; 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 microorganisms. 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. 2 lectures, 3 hours lab. Prerequisite: 20 hours in the biological sciences.

512 Transmission Electron Microscopy. (4) F, S
Theory, use, and methods of preparing biological materials for transmission electron microscopy. Materials fee. 2 lectures, 6 hours lab. Prerequisite: instructor approval.

515 Scanning Electron Microscopy. (2) SS
Theory and use of scanning electron microscope for biological materials. Intensive five-week mini course. Materials fee. 3 hours lecture, 6 hours lab. Prerequisite: instructor approval.

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 instructor approval.

526 Quantitative Ecology. (3) N
Sampling strategies, spatial pattern analysis, species diversity, classification and applications of multivariate techniques to ecology. 2 lectures, 3 hours lab. Prerequisites: one course in ecology; BIO 415† or equivalent.

Special Courses: BIO 294, 394, 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 598, 599. (See pages 36-37.)

Botany

PROFESSORS:
SOMMERFELD (LS C-210) ARONSON, NASH, PATTEN, PINKAVA, TRELEASE
ASSOCIATE PROFESSORS:
CLARK, KLOPATEK, SZAREK, TOWILL
ASSISTANT PROFESSOR:
VERMAAS
PROFESSORS EMERITI:
CANRIGHT, DYCUS

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Botany. Consists of a minimum of 41 semester hours in botany and approved related fields, and a minimum of 22 semester hours in supplemental courses. Required courses are BIO 181, 182, 320, 340, 420; BOT 350, 360, 370; MIC 205 (or 220), 206; 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, 361 or the sequence 331, 332, 335 and 336; MAT 210; STP 420 or BIO 415.

Departmental Graduate Programs

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

BOTANY

BOT 108 Plants and Society. (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. 3 lectures, 3 hours lab. *[Satisfies General Studies Requirements: S1, S2]*

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. 3 hours lecture, 3 hours lab. Prerequisite: one of the following: BIO 100, 182; BOT 108; ZOL 110; or equivalent. *[Satisfies General Studies Requirement: S2]*

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. 3 lectures, 3 hours lab. Prerequisite: BIO 182 or equivalent.

360 Plant Physiology. (4) F, S
Plant growth and development, nutrition, water relations, reproduction, metabolism and photosynthesis. 3 lectures, 3 hours lab. Prerequisites: BIO 182 or equivalent; CHM 115†.

370 The Flora of Arizona. (4) S
Principles of taxonomy, identification of Arizona plants. 2 lectures, 6 hours lab. Prerequisite: BIO 182 or equivalent; or instructor approval.

410 Lichenology. (3) F '88
Chemistry, ecology, physiology and taxonomy of lichens. 2 lectures, 3 hours lab. Prerequisite: BIO 182 or equivalent.

420 Plant Ecology. (4) S
Plants in relation to environments. 3 lectures, 3 hours lab or field trip. 1 weekend field trip. Prerequisite: BIO 320† or equivalent.

425 Plant Geography. (3) F '88
Plant communities of the world and their interpretation, emphasizing North American plant associations. Prerequisite: BIO 182 or equivalent; or instructor approval.

434 General Mycology. (3) F '88
Various groups of fungi, their morphology, identification procedures and economic significance. 2 lectures, 3 hours lab. Prerequisite: BIO 182 or equivalent; or MIC 206†.

445 Morphology of the Vascular Plants. (4) N
Comparative form and evolutionary trends in the major groups of vascular plants. 3 lectures, 3 hours lab. Prerequisite: BOT 300† or equivalent.

448 Palynology. (2) F '89
Importance of spores and pollen (both fossil and modern) to systematics, evolution, ecology and stratigraphy. Prerequisite: instructor approval.

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. 3 lectures, 3 hours lab. Prerequisite: BIO 182 or instructor approval.

461 Physiology of Lower Plants. (3) F '88
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. 3 lectures, 6 hours lab. 2 field trips. Not open to students who have had BOT 370†.

475 Angiosperm Taxonomy. (3) S '89
Principles underlying angiosperm phylogeny. 2 lectures, 3 hours lab. Prerequisite: BOT 370† or instructor approval.

480 Plants: Pleasures and Poisons. (3) SS
Poisonous, medicinal, and other drug plants. Plant products and their effects on man; historical and modern perspectives. Prerequisites: BIO 100, 182; BOT 108 or equivalent; CHM 231† or equivalent.

490 Paleobotany. (4) S '89
A broad survey of plant life of the past, including the structure of plant fossils, their geologic ranges, geographic distribution and paleoenvironment. 3 lectures, 3 hours lab or field trip. Prerequisite: BIO 182 or equivalent.

510 Experimental Design. (3) S '89
ANOVAS, one-way classification of factorial and partially hierarchic designs, introductory multivariate statistics. One 3-hour lecture at night. Prerequisite: BIO 415† or equivalent.

520 Biophysical Ecology. (2) F '88
Principles of physical microenvironments and effects on plant growth. Analytical methods used in the study of energy exchange and soil-plant-atmosphere water relations. Prerequisite: BIO 320 or equivalent.

525 Ecophysiology. (3) F '89
Physiological adaptation to environmental stresses and its ecological significance for plant survival. Environmental and biological control of photosynthesis and transpiration. Prerequisite: BOT 360† or instructor approval.

564 Plant Metabolism. (3) F '89
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: BOT 360†; CHM 231†; or instructor approval.

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

576 Experimental Plant Systematics. (3) N
Interpretation of taxa, utilizing cytological, genetic, ecological, morphological and anatomical techniques and data. 2 lectures, 3 hours lab. Prerequisite: BOT 370 or 470 or instructor approval.

591 Seminar. (1) F, S
Topics may be selected from the following:
(a) Biosystematics
(b) Nonvascular Plants/Protists
(c) Ecology
(d) Plant Physiology

Special Courses: BOT 294, 484, 492, 493, 494, 497, 498, 499, 500, 590, 591, 592, 598, 599, 700, 790, 791, 792, 799. (See pages 36-37.)

Chemistry

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

ASSOCIATE PROFESSORS:
BALASUBRAMANIAN, BLANKENSHIP, LOHR, PETUSKEY, ROSE

ASSISTANT PROFESSORS:
HUNGATE, McMILLAN, SKIBO, STEIMLE, WOLF, WOODBURY

PROFESSORS EMERITI:
D. BROWN, BURGOYNE, BURKE, LUCHSINGER, MOELLER, SANDERSON, STUTSMAN, THOMSON

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Chemistry. Consists of 45 semester hours, 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 MAT 115†, 210 or equivalent; PHY 111†, 112, 113, 114; 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 81.)

Bachelor of Science Degree Curriculum

Chemistry. Consists of 42 semester hours in chemistry. Required courses are: CHM 117†, 118, 317, 318, 319, 320, 425, 426, 427, 428, 441, 442, 444 and 453. In addition, MAT 290†, 291 (or 270†, 271, 272); PHY 115†, 116, 117, 118; 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. MAT 274 and an appropriate course in computer language are strongly recommended. The remaining chemistry courses to complete the major will be determined by the student in consultation with an 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 81.)

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 during their junior year, in either the B.A. or B.S. program, have the opportunity to participate in a chemistry exchange program with the Federation 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. Students who wish to participate in this program are advised to begin or continue study of French in the freshman year.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree

Chemistry. Option 1. Consists of 42 semester hours 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 PHY 480†); MAT 115†, 210; and PHY 111†, 112, 113, 114. 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 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 M.S. and Ph.D. degrees. Consult the *Graduate 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. 3 lectures, 1 quiz, 2 hours lab. *[Satisfies General Studies Requirements S1, S2]*

113 General Chemistry.* (4) F, S, SS
Principles of chemistry. Adapted to the needs of students in the physical, biological and earth sciences. 3 lectures, 1 quiz, 2 hours lab. Prerequisite: 3 semesters of high school algebra or MAT 106; 1 year of high school chemistry recommended. *[Satisfies General Studies Requirements: S1, S2]*

114 General Chemistry for Engineers.* (4) F,S
One semester college chemistry with emphasis towards engineering. 3 lectures, 1 quiz, 2 hours lab. Students without high school chemistry or chemical engineering majors must enroll in the CHM 113†, 116† sequence instead of CHM 114. Prerequisites: 3 semesters of high school algebra or MAT 106; 1 year of high school chemistry. *[Satisfies General Studies Requirements: S1, S2]*

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. 3 lectures, 2 quizzes, 4 hours lab. Prerequisite: CHM 113† or 2 years of high school chemistry. *[Satisfies General Studies Requirements: S1, S2]*

116 General Chemistry.* (4) F, S
Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals and metalloids, introduction to organic chemistry. 3 lectures, 1 quiz, 2 hours lab. Prerequisite: CHM 113† or 2 years of high school chemistry. *[Satisfies General Studies Requirements: S1, S2]*

117, 118 Advanced General Chemistry.* (4, 5) F, S
Topics include atomic and molecular structure, properties and physical states of matter, thermodynamics, kinetics, acids and bases, chemical analysis and stoichiometry. CHM 117: 3 lectures, 1 conference, 2 hours lab. CHM 118: 3 lectures, 1 conference, 5 hours lab. Prerequisite for 118: CHM 117. Corequisite for 118: MAT 270† or 290†. *[Satisfies General Studies Requirements: S1, S2]*

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. 1 conference, 5 hours lab. Corequisite: CHM 225†.

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. 3 lectures, 1 quiz, 2 hours lab. Prerequisite: CHM 101, 114†, 115† or 116†; 1 year of high school chemistry with grades of "A" or "B"; or instructor approval.

261 Elementary Biochemistry. (3) F, S
Structure functions and metabolism of biomolecules at a level suited to students with limited training in chemistry and mathematics. Emphasis on examples from health sciences and agriculture. Not available to students with credit in CHM 331 or 361. Prerequisites: CHM 231; MAT 117.

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) F, S
Structures, reaction mechanisms and kinetics, and systematic syntheses of organic compounds. Prerequisite: CHM 118†. Corequisite for 317: CHM 319†. Corequisite for 318: CHM 320†.

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

320 Organic Chemistry Laboratory II for Majors.* (2) S
Continuation of CHM 319. 1 conference, 7 hours lab. Pre- or corequisite: CHM 318†.

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

335, 336 General Organic Chemistry Laboratory.* (1) F, S, SS
Organic chemical experiments in separation techniques, synthesis, analysis and identification, and relative reactivity. 4 hours lab. Prerequisite for 336: CHM 335†. Corequisites for 335: CHM 331†. Corequisite for 336: CHM 332†.

341 Elementary Physical Chemistry.* (3) F
Thermodynamics, equilibrium, states of matter, solutions, chemical kinetics. For students in pre-medical, biological and educational curricula. Not open to students who have taken CHM 441. Prerequisites: CHM 114†, 118† or 225†; CHM 231† or 331†; MAT 210†.

343 Physical Chemistry Laboratory.* (1) F
Physical chemical experiments. 3 hours lab. Corequisite: CHM 341† or 441†.

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. Not open to students who have taken CHM 461. Prerequisite: CHM 231†, 318† or 332†.

367 Elementary Biochemistry Laboratory. (1) F, S
Experiments include qualitative and quantitative analyses of constituents of biological systems, measurement of enzyme activities and metabolic studies. 3 hours lab. Pre- or corequisite: CHM 361† or instructor approval.

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

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†, 332† or instructor approval.

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

422 Instrumental Analysis Laboratory.* (1) S
Experiments in chemical analysis by electroanalytical and optical techniques. 3 hours lab. Corequisite: CHM 421†.

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. 2 lectures, 4 hours lab. Prerequisites: CHM 318† or 332†, 442; or instructor approval.

425 Chemical Analysis. (2) F
Principles of chemical equilibria, separations, and analyses; chemical instrumentation. Pre- or corequisite: 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) F, S
Classical and instrumental techniques in chemical analyses with emphasis on accuracy and precision. 1 conference, 5 hours lab. Pre- or corequisite for 427: CHM 425†. Pre- or corequisite for 428: CHM 426†.

431 Qualitative Organic Analysis. (3) F
Systematic identification of organic compounds. 1 lecture, 6 hours lab. Prerequisites: CHM 118† or 226†, 320† or 336†; or instructor approval.

438 Polymers. (2) S
Chemistry and properties of natural and synthetic polymers. Prerequisite: CHM 318 or 332.

441, 442 General Physical Chemistry. (3) F, S
Laws of thermodynamics and their applications, properties of gases, solids, liquids and solutions, reaction kinetics, wave mechanics, molecular spectroscopy, statistical thermodynamics. Not open to students who have taken CHM 341. Prerequisites: ECE 202†; PHY 112† or 116†.

444 General Physical Chemistry Laboratory.* (2) S
Physical chemical experiments. 1 conference, 5 hours lab. Prerequisite: CHM 441†.

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†, 225† or PHY 361†.

448 Radiochemistry Laboratory. (2) N
Radiation measurements, tracer methods, quantitative identification of isotopes, and other procedures applicable to chemical, physical, engineering and biological problems. 1 conference, 5 hours lab. Corequisite: CHM 447†.

452 Inorganic Chemistry Laboratory. (2) S
Preparation and characterization of typical inorganic substances emphasizing methods and techniques. 1 conference, 5 hours lab. Prerequisite: instructor approval.

453 Inorganic Chemistry. (3) F, S
Principles and applications of inorganic chemistry. Prerequisites: CHM 341† or 441†.

461, 462 General Biochemistry. (3) F, S
Structure, chemistry and metabolism of biomolecules and their role in the biochemical processes of living organisms.

Not open to students who have taken 361. Prerequisites: CHM 318† or 332†, 341† or 441†; or instructor approval.

467, 468 General Biochemistry Laboratory. (2) S,F
The application of modern chemical and physical methods to biochemical problems; purification and characterization of biological macromoecules; quantitative measurement of enzyme activity and properties; evaluation of metabolic processes. 1 conference, 5 hours lab. Prerequisite for 467: CHM 461†. Prerequisite for 468: CHM 462†.

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 instructor approval.

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: instructor approval.

481 Geochemistry. (3) F
Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere. Cross-listed as GLG 481. Prerequisite: CHM 341†, 441† or GLG 321.

482 Physical Geochemistry. (3) N
Applications of thermodynamic and kinetic principles to geochemical processes. Cross-listed as GLG 482. Prerequisite: CHM 341†, 441† or GLG 321†.

485 Meteorites and Cosmochemistry. (3) N
Chemistry and mineralogy of meteorites and their relationship to the origin of the earth, solar system and universe. Cross-listed as GLG 485. Prerequisite: CHM 481† or 482†.

501 Current Topics in Chemistry. (1) F, S
May be repeated for credit. Prerequisite: instructor approval.

521 Computer Interfacing to Chemical Instrumentation. (3) N
Assembly and machine language programming of laboratory-size computers for data acquisition and on-line, 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. 2 lectures, 4 hours lab.

523 Advanced Analytical Chemistry. (3) A
Theoretical principles of analytical chemistry. Prerequisites: CHM 225†, 442†; or 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. 3 lectures, 3 hours lab. Prerequisite: CHM 442†.

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. 3 lectures, 3 hours lab. Prerequisite: CHM 442†.

527 Electrical Methods of Chemical Analysis. (4) N
Theoretical and practical considerations of polarography, potentiometric, amperometric, and conductometric titrations. 2 lectures, 6 hours lab. Prerequisite: CHM 442†.

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†; 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. May be repeated for credit. Prerequisites: CHM 532†, 537†; instructor approval.

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: instructor approval.

548 Chemical Kinetics. (2) N
Kinetic theory and rate processes. Prerequisite: instructor approval.

553 Inorganic Chemistry. (3) F
Principles of modern inorganic chemistry and their applications over the entire periodic system. Prerequisites: CHM 442†, 453†; or 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
May be repeated for credit. Prerequisites: CHM 553†; instructor approval.

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 442†, 462†.

579 Topics in Solid State Chemistry. (2-4) N
May be repeated for credit. Prerequisite: instructor approval.

581 Isotope Geochemistry. (3) N
Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Cross-listed as GLG 581. Prerequisite: instructor approval.

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. May be repeated for credit. Cross-listed as GLG 582. Prerequisite: instructor approval.

583 Phase Equilibria and Geochemical Systems. (3) N
Study of natural reactions at high temperatures and pressures; silicate, sulfide and oxide equilibria. Cross-listed as GLG 583. Prerequisite: CHM 482†.

Special Courses: CHM 294, 298, 394, 484, 492, 493, 494, 498, 499, 590, 591, 592, 593, 594, 598, 599, 790, 792, 799. (See pages 36-37.)

*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 361 or 461; 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.

Computer Science

Majors in Computer Science are offered in both the College of Liberal Arts and Sciences or the College of Engineering and Applied Sciences. Faculty and course descriptions are listed on pages 300-306.

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Computer Science. The major in Computer Science consists of 30 hours of core course work and 15 semester hours of senior-level breadth courses in the major. Also required are 18 semester hours of technical elective and mathematics courses approved by the department in addition to college algebra. The university requirement on literacy and critical discourse is to be met in part by either ECE 400 or ENG 301.

A 2.75 cumulative grade point average is required to begin upper-division work in the major.

Economics

A major in Economics is offered in the College of Liberal Arts and Sciences or the College of Business.

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Economics. Consists of 45 semester hours, of which 24 must be in economics and 21 in closely related fields to be approved by the advisor in consultation with the student.

The following lower-division courses are required and must be counted as part of the 45-hour major:

ECN	111	Macroeconomic Principles
ECN	112	Microeconomic Principles
MAT	270	Calculus with Analytic Geometry I
STP	226	Elements of Statistics

A minimum grade of "C" must be earned in each of the above courses in order to qualify for upper-division courses in economics. ECN 313 and 314 are required and must be taken after the completion of MAT 270 and prior to other upper-division courses in economics. Concurrent enrollment in ECN 313 and 314 is permitted. Concurrent enrollment with one of the above and other upper-division courses in economics is subject to advisor approval. In addition, the Economics major must choose six hours of closely related field courses from a short list of courses selected by the economics faculty. (See degree requirements, page 81.)

Bachelor of Science Degree Curriculum

Economics. Consists of 45-55 semester hours, of which 24 must be in economics and the remainder in closely related fields to be approved by the advisor in consultation with the student.

The following lower-division courses are required and must be counted as part of the 45-hour major:

ECN	111	Macroeconomic Principles
ECN	112	Microeconomic Principles
MAT	270	Calculus with Analytic Geometry I
STP	226	Elements of Statistics

A minimum grade of "C" must be earned in each of the above courses in order to qualify for upper-division courses in economics. ECN 313 and 314 are required and must be taken after the completion of MAT 270 and prior to other upper-division courses in economics. Concurrent enrollment in ECN 313 and 314 is permitted. Concurrent enrollment with one of the above and other upper-division courses in economics is subject to advisor approval. In addition, the Economics major must choose six hours of closely related field courses from a short list of courses selected by the economics faculty. (See degree requirements, page 81.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

(Secondary Education)

Economics. Consists of 45 semester hours, of which 24 must be in economics and one course in methods of teaching a social science. The remainder will be in closely related fields as approved by the advisor in consultation with the student.

The following lower-division courses are required and must be counted as part of the 45-hour major:

ECN	111	Macroeconomic Principles
ECN	112	Microeconomic Principles
MAT	270	Calculus with Analytic Geometry I
STP	226	Elements of Statistics

A minimum grade of "C" must be earned in each of the above courses in order to qualify for upper-division courses in economics. ECN 313 and 314 are required and must be taken after the completion of MAT 270 and prior to other upper-division courses in economics. Concurrent enrollment in ECN 313 and 314 is permitted. Concurrent enroll-

ment with one of the above and other upper-division courses in eonomics is subject to advisor approval. In addition, the Economics major must choose six hours of closely related field courses from a short list of courses selected by the economics faculty.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Economics. Consists of 21 semester hours. ECN 111 and 112, and MAT 210 are required. Remainder to be approved by the advisor in consultation with the student.

Latin American Studies Emphasis. (See Latin American studies, page 86.) 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 hours 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 M.S. and Ph.D. degrees. Consult the *Graduate Catalog* for requirements.

Faculty and course descriptions are listed on pages 207-209.

English

PROFESSORS:
BATAILLE (LL B-504), BRACK, J. BRINK, D'ANGELO, B. DOEBLER, J. DOEBLER, DONELSON, DOVE, DUBIE, EVANS, FERRELL, FISHER, FLETCHER, HABERMAN, M. HARRIS, HELMS, KEHL, LIGHTFOOT, NEY, NILSEN, SALERNO, SANDS, SHAFER, SHINN

ASSOCIATE PROFESSORS:
BENDER, BJORK, BOYER, D. BRINK, BUCKINGHAM, J. GREEN, M. GREEN, GREENE, HAKAC, JANSSEN, JOHNSON, MORAN, MURRAY, OJALA, RIOS, SCHWALM

ASSISTANT PROFESSORS:
ADAMS, BAROODY, BROSE, CARLSON, COLBY, GUTIERREZ, MILLER, MORGAN, NELSON, PEARSON, SENSIBAR, WILKINS

INSTRUCTOR:
K. HARRIS

INVITATIONAL LECTURER:
COOK

PROFESSORS EMERITI:
EMERY, ERNO, HERMAN, LAMBERTS, LYLE, NEBEKER, PORTNOFF, POWERS, RANDALL, TURNER

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

English. Consists of 45 semester hours; 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, 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 81.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

English. Consists of 42 semester hours 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), 9 of which must be upper division.

Departmental Minor Teaching Field Requirements

(Secondary Education)

(Recommended for Elementary Education)

English. Consists of 24 semester hours. 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.

Minor in English for College of Liberal Arts and Sciences

The English minor for students in other disciplines in the College of Liberal Arts and Sciences shall consist of 24 hours in English. Eighteen hours must be selected as follows: ENG 200, 221 (or 222), 312 (or 314, 413 or 424), 341 (or 342), 421 (or 422); and one upper-division course in English or American literature. Six further hours will be free electives chosen from the English Department's offerings at the 200-level or above.

Departmental Graduate Programs

The Department of English offers programs leading to the degrees of Master of Arts (with emphases in literature, comparative literature, the teaching of English as a Second Language, and linguistics); a Master of Fine Arts (fiction, poetry, non-fiction and screenwriting); and Doctor of Philosophy (with numerous emphases).

English faculty currently serve as editors of *English Journal*, *Modern Scandinavian Literature in Translation*, *Studies in 18th Century Culture*, and *WHIM*. Other faculty serve on the editorial boards of *English Literature in Transition*, *Metaphor and Symbolic Activity: An Interdisciplinary Journal of Empirical Inquiry*, *Modern Language Journal*, *Rhetoric Review*, *Resources for American Literary Study*, *Dickinson Studies*, *18th Century: A Current Bibliography*, and *Callaloo*. The Creative Writing faculty includes three Guggenheim fellows and a Pulitzer Prize winner. Among recent books published by the faculty are *Continuities: Essays and Ideas in American Literature*, *G.B. Shaw: An Annotated Bibliography of Writings about Him*, *The Old English Verse Saints' Lives*, *The Origins of Faulkner's Art*, *Richard Brautigan*, *Sea Brothers: The Traditions of American Sea Fiction from Moby Dick to the Present*, *Venus and Adonis: A Facsimile Edition*, *W.B. Yeats and His Contemporaries*, and *Worlds Within Women: Myth and Mythmaking in Fantastic Literature by Women*.

ENGLISH

ENG 101 First-Year Composition. (3) F, S, SS
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) F, S, SS
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 First-Year Composition. Prerequisite: see page 81.

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. *[Satisfies General Studies Requirements: HU, H]*

Completion of the First-Year Composition requirement is a prerequisite for all English Department courses at the 200-level and above.

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: 1 semester of First-Year Composition. *[Satisfies General Studies Requirements: L1, HU]*

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. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, H]*

204 Literature of Today. (3) F, S
Poetry, short story, novel and drama. Not for English majors. Not open to freshmen. *[Satisfies General Studies Requirement: HU]*

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†. *[Satisfies General Studies Requirement: L1]*

212 English Prose Style. (3) N
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. *[Satisfies General Studies Requirement: L1]*

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. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, H]*

260 Film Analysis. (3) N
Understanding and enjoyment of film and its correlation to literature, art, music and other disciplines. *[Satisfies General Studies Requirement: HU]*

A term paper or equivalent out-of-class written work is required in all upper-division (300-400 level) ENG courses.

301 Writing for the Professions. (3) F, S
Advanced practice in writing and editing expository prose. Primarily for preprofessional majors. *[Satisfies General Studies Requirement: L1]*

303 Classical Backgrounds of English Literature. (3) N
Selected readings of Greek and Latin literature in translation, emphasizing forms, ideas and myth, as they relate to literature in English. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

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 instructor approval.

312 English in its Social Setting. (3) F, S
Introduction to the sociolinguistic study of the English language. Prerequisite: junior standing or instructor approval. *[Satisfies General Studies Requirement: HU]*

314 Modern Grammar. (3) F, S
Modern descriptive models of English grammar. Prerequisite: junior standing or instructor approval. *[Satisfies General Studies Requirement: HU]*

321 Introduction to Shakespeare. (3) F, S
Shakespeare's major comedies, histories and tragedies. Not open to English majors. *[Satisfies General Studies Requirement: HU]*

341 American Literature. (3) F, S
From Colonial times to the Civil War, including the growth of nationalism and romanticism. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studes Requirements: HU, H]*

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. *[Satisfies General Studies Requirement: HU]*

355 History of the Drama. (3) S
Development of European drama from the Greek to the Romantic Period. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, H]*

357 Introduction to Folklore. (3) N
Survey of the history, genres and dynamics of folklore with emphasis on oral traditions. *[Satisfies General Studies Requirement: HU]*

358 Afro-American Literature. (3) N
Thematic and cultural study of Afro-American literature. *[Satisfies General Studies Requirements: L2, HU, H]*

359 American Indian Literatures. (3) S
Selected oral traditions of American Indians and their influences on contemporary Native American literary works. *[Satisfies General Studies Requirements: HU, H]*

360 History of Film. (4) N
Emphasis on American film, with some study of European film. 3 lectures, 4 hours of screening. *[Satisfies General Studies Requirements: HU, H]*

361 Silent Film. (4) F
Development of motion pictures from 1850 through 1930. 3 lectures, screenings. *[Satisfies General Studies Requirements: HU, H]*

362 Sound Film Genres. (4) S
Examination of the Western, the horror film, the comedy and other genres. 3 lectures, screenings. *[Satisfies General Studies Requirement: HU]*

400 History of Literary Criticism. (3) S
Major critics and critical traditions in the western world. Prerequisite: 6 hours of literature or instructor approval. *[Satisfies General Studies Requirements: L2, HU, H]*

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 instructor approval.

412 Professional Writing. (3) N
Lectures and conferences concerning techniques of writing for publication. Prerequisite: ENG 310 or instructor approval.

413 History of the English Language. (3) F, S
Development of English from the earliest times to the modern period. Prerequisite: junior standing or instructor approval. *[Satisfies General Studies Requirement: HU]*

415 Medieval Literature. (3) F
Medieval English literature in translation, from *Beowulf* to Malory (excluding Chaucer), emphasizing cultural and intellectual backgrounds; includes continental works. *[Satisfies General Studies Requirement: HU]*

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 instructor approval. *[Satisfies General Studies Requirement: HU]*

419 English Literature in the Early Seventeenth Century. (3) S
Prose and poetry, exclusive of Milton and the drama. Metaphysical, Cavalier, neo-classical verse; Donne, Jonson, Bacon and other representative writers. Prerequisite: ENG 221 or instructor approval. *[Satisfies General Studies Requirements: L2, HU, H]*

420 Renaissance Drama. (3) S
Sixteenth- and seventeenth-century drama. Marlowe, Kyd, Jonson and other representative writers, exclusive of Shakespeare. Prerequisite: ENG 221 or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

421 Shakespeare I. (3) F, S
A selection of comedies, histories and tragedies including *Midsummer Night's Dream, Henry IV, Hamlet* and *Macbeth*. *[Satisfies General Studies Requirements: HU, H]*

422 Shakespeare II. (3) F, S
A selection of comedies, histories and tragedies including *Twelfth Night, King Lear, The Tempest* and *Othello*. *[Satisfies General Studies Requirement: HU]*

423 Milton. (3) F, S
Selected prose and poetry, emphasizing *Paradise Lost, Paradise Regained* and *Samson Agonistes*. Prerequisite: ENG 221 or instructor approval. *[Satisfies General Studies Requirement: HU]*

424 Chaucer. (3) F, S
Chaucer's language, poetry and intellectual background. *[Satisfies General Studies Requirement: HU]*

425 Romantic Poetry. (3) F
Poetry of Wordsworth, Coleridge, Shelley, Keats, Byron. *[Satisfies General Studies Requirements: L2, HU]*

426 Victorian Poetry. (3) S
Poetry of the second half of the 19th century. Special study of Tennyson, Browning, Arnold. *[Satisfies General Studies Requirements: L2, HU, H]*

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. *[Satisfies General Studies Requirements: L2, HU, H]*

428 Age of Dryden, Swift and Pope. (3) F
Chief writers and movements in the nondramatic literature of the Restoration and early 18th century. *[Satisfies General Studies Requirements: L2, HU, H]*

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 instructor approval. *[Satisfies General Studies Requirements: L2, HU, H]*

435 19th-Century American Poetry. (3) S
Themes and developments in American poetry to 1900, including Poe, Whitman and Dickinson. *[Satisfies General Studies Requirements: HU, H]*

439 Drama from Dryden to Sheridan. (3) S '90
English drama of the Restoration and 18th century, especially critical theories and social forces affecting the stage. *[Satisfies General Studies Requirements: L2, HU]*

440 American Literature to 1815. (3) N
Thought and expression from the time of the first English-speaking colonies to 1815. *[Satisfies General Studies Requirements: HU, H]*

441 20th-Century American Drama. (3) N
American drama since World War I, especially experimental techniques. *[Satisfies General Studies Requirements: L2, HU]*

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. *[Satisfies General Studies Requirements: HU, H]*

444 American Romanticism, 1830-1860. (3) F
Art and ideas of major American transcendentalists and romantics. *[Satisfies General Studies Requirements: HU, H]*

445 American Realism, 1860-1900. (3) S
Writers and influences that shaped the development of literary realism. *[Satisfies General Studies Requirements: HU, H]*

448 20th-Century British Novel. (3) S
Twentieth-century British novel since 1914. *[Satisfies General Studies Requirement: HU]*

451 The Novel to Jane Austen. (3) F
From origins of prose fiction through the 18th century. *[Satisfies General Studies Requirements: L2, HU, H]*

452 The 19th-Century Novel. (3) S
From Scott to Conrad. *[Satisfies General Studies Requirements: L2, HU, H]*

453 The American Novel to 1900. (3) F
The rise and development of the novel to Dreiser. *[Satisfies General Studies Requirements: L2, HU, H]*

454 The American Novel, 1900-1945. (3) F
Developments in theory and practice of major novelists. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirement: HU]*

458 American Novel Since 1945. (3) S
Major novelists of the period: developments in theory and practice. *[Satisfies General Studies Requirements: L2, HU]*

460 Western American Literature. (3) S
Critical examination of ideas and traditions of the literature of the western United States, including the novel. *[Satisfies General Studies Requirements: HU, H]*

461 Women and Literature. (3) N
Selected topics in literature by or about women. May be repeated for credit when topics vary. *[Satisfies General Studies Requirements HU, H]*

462 Twentieth-Century Women Authors. (3) F
Critical examination of literature by women writers who reflect twentieth-century perspectives in British, American and world literature. Prerequisite: instructor approval.

463 European Drama from Ibsen to 1914. (3) N
Chief continental and British dramatists of the period: the beginnings and development of realism. *[Satisfies General Studies Requirements: HU, H]*

464 European Drama from 1914 to the Present. (3) N
Chief continental and British dramatists of the period, emphasizing experimental techniques. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirement: HU]*

480 Methods of Teaching English. (3) F, S
Methods of instruction, organization and presentation of appropriate content in English. Prerequisite: ENG 312, 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 instructor approval.

500 Research Methods. (3) F
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 standing.

510 English Linguistics. (3) F
Current approaches to the study of the English language.

511 English Phonetics and Phonology. (3) S
Current trends in phonological theory and its basis in acoustic and articulatory phonetics. Prerequisite: ENG 510 or equivalent; or instructor approval.

512 The Teaching of Composition. (3) N
The theory and practice of teaching writing at all levels. Emphasis on current research. Prerequisites: teaching experience; instructor approval.

513 Semantic Theory. (3) F
Current approaches to linguistic meaning, with particular attention to English. Prerequisite: ENG 510 or equivalent; or instructor approval.

514 Advanced Grammar. (3) S
The analysis of English grammatical structure with contemporary theoretical models. Prerequisite: ENG 510 or equivalent; or instructor approval.

515 Middle English Literature. (3) N
English literature from the 12th through the 15th century, exclusive of Chaucer. Prerequisite: ENG 509 or instructor approval.

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
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, 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.

571 Advanced Study in Literature for Adolescents. (3) N
History and criticism of adolescent literature. Prerequisite: ENG 471 or instructor approval.

572 Language Acquisition in Reading and Writing. (3) F
Studies in the application of research in language acquisition to the teaching of language, reading and writing.

573 Censorship and Literature. (3) N
The history of censorship, primarily in the United States and significant court decisions that affected writers and books.

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 36-37.)

HUMANITIES

HUM 110 Contemporary Issues in Humanities. (3) F, S
Contemporary issues and problems as reflected primarily in literature. *[Satisfies General Studies Requirements: HU, G, H]*

301, 302 Humanities in the Western World. (4) F, S
Interrelation of arts and ideas in Western Civilization. HUM 301, Hellenic through Medieval; 302, Renaissance to the present. 3 lectures, 1 discussion meeting per week. *[Satisfies General Studies Requirements: HU, H]*

413 Comedy: Meaning and Form. (3) S
Nature and characteristics of the experience of comedy: classical, Renaissance and modern. *[Satisfies General Studies Requirement: HU]*

414 Tragedy: Meaning and Form. (3) A
Nature and characteristics of literary and artistic expressions called tragic. Prerequisites: HUM 301, 302; or equivalent. *[Satisfies General Studies Requirement: HU]*

Special Courses: HUM 294, 394, 492, 493, 494, 497, 499, 590, 591, 592, 598, 599. (See pages 36-37.)

Family Resources and Human Development

PROFESSORS:
PETERSON (HEC 106), HOOVER, MORGAN
ASSOCIATE PROFESSORS:
BAKER, HUGHSTON, MONTE, ROOSA, VAUGHAN
ASSISTANT PROFESSORS:
CHRISTOPHER, FABES, HUNTER, JOHNSTON, MANORE, PETERS, WILSON
PROFESSORS EMERITI:
BARKLEY, BRESINA, CREIGHTON, ELLSWORTH, KAGY, O'CONNOR, STANGE, WOOLDRIDGE

Departmental Major Requirements

For either the B.A. or B.S. degree (see CLAS requirements page 81), students must select one of the following areas of concentration:

Family Resources and Human Development in Business with an option in:

1. Food Service Management,
2. Consumer Service in Foods, or
3. Textiles and Clothing

Family Studies/Child Development

Human Nutrition-Dietetics with an option in:

1. Nutritional Science, or
2. Dietetics

Integrated Studies

Home Economics Education

Family Studies/Child Development. Consists of 33 hours of core family studies/child development classes plus 15 hours of classes within one of these options: family interaction, family economics/management, child development. Required core courses include: CDE 232†, 337†; FAS 330, 331, 357†, 361†, 435†, 454, 436†, 498; and one of the following statistics courses: EDP 454, PSY 230† or SOC 390†. Course FRD 330 is required of all options.

Family interaction option. Requires FAS 330†, 430, 431, 432 and 440. FAS 332 and FRD 451 are recommended.

Child development option. Requires CDE 430†, 437†, 498†; FAS 430 and 431.

Family economics/management option. Requires GNB 233; FAS 354, 440; and FRD 451†, 472 (or 476). FAS 494 is recommended.

Human Nutrition-Dietetics. The American Dietetic Association (ADA) has accredited the general, management, clinical and community options of the dietetics concentration as meeting their Plan IV requirements. In addition to the required courses specified below, 18 hours consisting of EDP 310 or equivalent; MGT 301; MIC 205, 206; and ZOL 201, 202 are required by both the ADA and the Department of Family Resources and Human Development. Additional courses required by the American Dietetic Association for completion of Plan IV requirements are to be selected upon consultation with advisor. Most of the Plan IV requirements also satisfy College of Liberal Arts and Sciences graduation requirements. Completion of any of these four options prepares the student for an accredited dietetics internship.

There are 22 hours of required departmental courses: FON 142, 241, 440, 441, 442, 444 and FRD 451 (maximum 3 semester hours). Course FRD 330 is required of all options.

General dietetics option. Additional departmental courses, totaling 19 hours, which are required are FON 341, 343, 344, 445, 446 and 448.

Management dietetics option. Additional departmental courses, totaling 9 hours which are required are FON 341, 343 and 344.

Clinical dietetics option. Additional departmental courses, totaling 7 hours, which are required are FON 446 and 448.

Community dietetics option. Additional departmental courses, totaling 10 hours, which are required are FON 341, 446 and 448.

Human nutrition option. Additional departmental course, totaling 4 hours, which is required is FON 446.

Integrated Studies. Consists of 42 semester hours. The required courses in the major are: CDE 232; FAS 331, 354, 357, 432; FON 241 or equivalent, 450, 451; FRD 272, 330, 494, 498; TXC 223, 424. In addition to the 42 semester hours in the major, the remaining required courses are: CSC 180; ECN 111/112; and 3 semester hours from one of the following: BIO 415; EDP 454; PSY 230; QBA 221; SOC 390.

Family Resources and Human Development in Business. Course FRD 330 is required of all options.

Food service management option. Consists of 18 hours of required departmental courses: FON 142, 241 or equivalent, 341, 343, 344 and 445. In addition, credits are required from the following: ACC 211, 212; AGB 364; HES 494: Foodborne Diseases

or Micro Ecol of Foods, MGT 301, 311, 413 (or 422 or 468), 423; and MIC 205, 206. Additional business courses are to be selected upon consultation with advisor.

Consumer service in foods option. Consists of 19 hours of required departmental courses: FAS 354; FON 142, 241 or equivalent, 341, 442; FRD 451. Other courses required for this degree totaling 24 semester hours are: ACC 498 or equivalent; AGB 364; HES 494: Foodborne Diseases or Micro Ecol of Foods; MGT 301; and MKT 300, 304, 310, 321.

Textiles and clothing option. Consists of 21 hours of required courses: TXC 122, 123, 223, 323, 424, 425 and 426. The student, with approval of the advisor, must select at least 14 semester hours from the following: one COM course; FRD 451; TXC 321, 423, 429, 494, 498. A minimum of 4 courses must be from TXC. In addition, 15 semester hours will be selected with approval of advisor from the following: ACC 211; ADV 301; ECN 111 (or FAS 354); GNB 233, 320; MGT 301, 311; MKT 300, 302, 304, 310, 321, 325, 424.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree

Family Resources and Human Development. Consists of 51 semester hours in family resources and human development. Major courses required are: CDE 232, 337; DSC 212, 347; FAS 331, 357; FON 142, 241 or equivalent; FRD 272, 330, 451; HEE 153 (or another family resources and human development course), 461, 480, 481; POS 110 (or 310), 311; and TXC 122 (or 123), 223.

Departmental Graduate Programs

The Department of Family Resources and Human Development offers programs leading to the M.S. degree. Consult the *Graduate Catalog* for requirements.

CHILD DEVELOPMENT

CDE 232 Human Development. (3) F, S
Lifespan development from conception through adulthood with emphasis on family influences. Recognition of individuality within the universal pattern of development. Prerequisites: PGS 100; SOC 101. *[Satisfies General Studies Requirement: SB]*

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. 1 lecture, 6 hours lab. Prerequisite: CDE 232 or equivalent.

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. *[Satisfies General Studies Requirement: SB]*

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. May include field trips. Prerequisite: CDE 337† or instructor approval.

437 Observational and Naturalistic Methods of Studying Children. (3) S
In-depth examination of implementing observational and naturalistic studies of children in a variety of settings. 2 lectures, 3 hours lab. Prerequisites: CDE 430†; 6 hours of psychology. *[Satisfies General Studies Requirement: SB]*

531 Theoretical Issues in Child Development. (3) F
Major developmental theories, related research, and their application to family interaction. Prerequisites: CDE 430†, 437†; or instructor approval.

533 Research Issues in Child Development. (3) S
An in-depth exploration and critique of research focusing on child development in a family setting. Prerequisites: CDE 531†; FRD 500.

534 Integration of Child Development Research and Theory. (3) F
Integrated approach to understanding the developmental, familial, and environmental influences on children's behavior. Prerequisites: CDE 531†; FRD 500.

Special Courses: CDE 498, 498, 590, 592, 599. (See pages 36-37.)

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: PGS 100; SOC 101; or equivalent. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

357 Family Resource Management. (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: PGS 100; SOC 101; or equivalent. *[Satisfies General Studies Requirement: SB]*

361 Introduction to Family/Child Research Methods. (3) S
Examines basic methods applied to family/child research, critiques current research literature, applies methods in current topics. Prerequisites: CDE 232; FAS 331; FRD 357.

390 Supervised Research Experience. (1-3) F, S, SS
Practical, first-hand experience within current faculty research projects in family studies or child development. "Y" grade only; may be repeated for total of 6 hours. Prerequisites: FAS 361†; 3.00 GPA in major; approval of supervising faculty member prior to registration.

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†, 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†; FAS 331†; or instructor approval.

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†. *[Satisfies General Studies Requirement: SB]*

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: CDE 232†; FAS 331†, 357 or 454†.

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.

494 Special Topics: Third World Women. (3) F
[Satisfies General Studies Requirement: G]

531 Family Theory Development. (3) S
Historical and current approaches to theory development, evaluation and application in family studies. Prerequisites: FAS 435 or instructor approval.

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 instructor approval.

536 Family Crises and Resources. (3) N
Special problems encountered in the family. Individual and community resources for approaching them. Prerequisites: CED 522; FAS 330†; or equivalent.

537 Interpersonal Relationships. (3) F
Critical examination of current theoretical and research developments in the area of interpersonal relationships. Applications for research and intervention emphasized. Prerequisite: FAS 435 or equivalent; or instructor approval.

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: instructor approval.

539 Research Issues in Family Interaction. (3) F
Critical review of current and past research in the area of family dynamics. Emphasizes interactional processes within the family. Prerequisite: FAS 435 or equivalent; or instructor approval.

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 instructor approval.

554 Family Economics. (3) N
Analysis of public policy affecting family economic behavior with respect to divorce, taxation, credit, population, and other issues. Prerequisite: ECN 201, 500† or FAS 354.

Special Courses: FAS 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

FOOD AND NUTRITION

FON 100 Introductory Nutrition. (3) F, S, SS
Basic concepts of human nutrition. Alternative diets and how food choices affect personal health. Prerequisite: nonmajor.

142 Applied Food Principles. (3) F, S
Applied scientific principles of food preparation and production. 2 lectures, 3 hours lab.

241 Human Nutrition. (3) F, S, SS
Principles of human nutrition relative to health. Emphasis on nutrients and the factors affecting their utilization in the human body. Prerequisite: CHM 101 or equivalent.

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. 2 lectures, 3 hours lab. Prerequisites: FON 142, 241 or equivalent.

343 Food Service Systems Procurement. (3) F
Food purchasing for institutions: cost factors, food laws, quality standards, and basic manufacturing processes. 2 lectures, 3 hours lab. Field trips may be taken. Prerequisite: FON 341† or instructor approval.

344 Food Service Systems Management. (3) S
Organization, administration, and management of food service in hospitals and other institutions. 2 lectures, 3 hours lab. Field trips may be included. Prerequisite: FON 343† or instructor approval.

440 Advanced Human Nutrition I. (3) F
Metabolic reactions and interrelationships of vitamins, minerals, and water. Prerequisites: CHM 361†; FON 241 or equivalent; ZOL 202†. CHM 332† recommended.

441 Advanced Human Nutrition II. (3) S
Metabolic reactions and interrelationships of carbohydrate, lipid, and protein. Prerequisites: CHM 361†; FON 241 or equivalent; ZOL 202†. 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. 2 lectures, 6 hours lab. Prerequisites: CHM 231†; FON 142.

444 Diet Therapy. (3) S
Principles of nutritional support for prevention and treatment of disease. Prerequisites: FON 241 or equivalent; 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. 1 lecture, 6 hours lab. May require field trips. Prerequisites: FON 241 or equivalent, 343†, 344†; or instructor approval.

446 Human Nutrition Assessment Laboratory. (4) N
Clinical and bio-chemical evaluation of nutritional status. 1 lecture, 9 hours lab. Prerequisites: CHM 367†; FON 440† or 441†.

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 241 or equivalent. 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 241 or equivalent.

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 241 or equivalent.

462 Consumer Service in Foods. (3) N
Organization, economics, and marketing as related to the food and equipment industries. Prerequisite: FON 142.

531 Recent Developments in Nutrition. (3) N
Survey of research. Prerequisites: one course in advanced nutrition and one in biochemistry.

532, 533 Current Research in Nutrition I, II. (3) N
I. Vitamins and Minerals. II. Carbohydrates, Lipids, and Proteins. Prerequisites: one course in advanced nutrition and one in biochemistry.

538 Recent Developments in Foods. (3) N
Discussion and critique of current research. Prerequisites: CHM 232†; FON 142.

540 Advanced Micronutrient Metabolism. (3) F
The metabolism of vitamins and minerals, primarily as applied to humans, with research literature emphasized. Prerequisites: one course in basic nutrition and one in biochemistry.

541 Advanced Macronutrient Metabolism. (3) S
The metabolism of protein, fat and carbohydrate, primarily as applied to humans, with research literature emphasized. Prerequisites: one course in basic nutrition and one in biochemistry.

542 Advanced Food Product Development. (4) F
Principles of food product development and testing, including current government regulations. 2 lectures, 6 hours lab. Prerequisites: FON 142; Inorganic Chemistry.

544 Therapeutic Nutrition. (3) S
Current theories of the nutritional prevention or treatment of various diseases. Prerequisites: one course in basic nutrition and one in physiology.

545 Recent Developments in Institutional Feeding. (3) F
Current practices in institutional feeding, including supervised practicum with local quantity food operation. 1 hour lecture, 6 hours lab. Prerequisites: FON 142, 343, 344; or instructor approval.

546 Assessment Techniques in Nutrition Research. (3) S
Current techniques in human nutrition research will be explored. Research literature will be reviewed and critiqued. Prerequisites: advanced nutrition and biochemistry.

546L Laboratory Techniques in Nutrition Research. (2) S
Laboratory techniques required in nutrition research, including spectroscopy, chromatograpy and RIA, will be taught. Prerequisites: advanced nutrition and biochemistry.

548 Nutrition Program Development. (3) F
The planning, development, implementation and evaluation of community nutrition programs, including the process of grant applications. Prerequisites: one course in basic nutrition and one in sociology.

550 Advanced Maternal and Child Nutrition. (3) F
Metabolic characteristics and nutritional needs of the pregnant woman, lactating woman, infant and child will be reviewed in depth. Prerequisites: one course in basic nutrition, physiology and biochemistry.

551 Advanced Geriatric Nutrition. (3) S
Metabolic characteristics and nutritional requirements of the elderly will be reviewed in depth. Prerequisites: one course in basic nutrition, physiology and biochemistry; or instructor approval.

Special Courses: FON 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

FAMILY RESOURCES AND HUMAN DEVELOPMENT

FRD 272 Basic Issues in Housing. (3) F
The study of housing: human needs, effects of the housing environment upon humans; legal and financial trends. *[Satisfies General Studies Requirement: SB]*

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. Prerequisites: major; 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. FAS majors may repeat for a total of 3 hours. Prerequisites: completion of 60 hours; instructor approval. Prerequisite (family management [FAS] majors): FAS 357. Prerequisite (textiles and clothing (TXC) majors intern program [12 semester hours]): ECN 111 or 112; MKT 300; TXC 122; grade point average of 3.00; senior standing the semester of program participation.

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: FRD 272.

500 Research Methods. (4) 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.

Special Courses: FRD 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

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. 2 lectures, 3 hours lab. 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. 2 lectures, 3 hours lab. May include field trips. Prerequisite: HEE 153 or instructor approval.

461 Presentations in Home Economics. (1-3) S
I, Application of demonstration principles; II, Multimedia presentations; III, Development of audiovisual materials for *home economics. 1 hour lecture, 6 hours lab for each* module. Prerequisites: junior standing; instructor approval.

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 semester hours. Dietetic students register for 3 semester hours.

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. May include field trips. Prerequisite: home economics major or minor.

582, 583 Program Planning and Evaluation in Home Economics. (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. Prerequisite:* home economics major or minor.

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 student 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. Prerequisite: home economics major or minor.

Special Courses: HEE 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

TEXTILES AND CLOTHING

TXC 122 Clothing and Human Behavior. (3) F, S
Emphasizes cultural influences, human behavior and design. *[Satisfies General Studies Requirement: SB]*

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. 1 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. 1 lecture, 4 hours studio. Prerequisites: TXC 122, 123.

323 Advanced Textiles. (3) F, S
Textile technology, fiber science, dyeing, finishing, and other topics. 2 lectures, 3 hours lab. May include field trips. Prerequisites: CHM 101; TXC 223. CHM 231† recommended.

327 Analysis of Ready-to-Wear. (3) F, S
Analysis and evaluation of ready-to-wear apparel with emphasis on standards of quality for design, fabrication, production and fit. Prerequisites: TXC 123, 223.

423 Apparel Analysis. (3) F, S
Specialized processes used with a wide variety of apparel fabrics. Interrelationships between fabric properties and apparel design. 2 lectures, 2 hours studio. May include field trips. Prerequisite: TXC 321†.

424 History of Costume. (3) F, S
Evolution of costume from ancient Egypt to the 20th century. May include field trips. Prerequisites: an ARS course; TXC 122. *[Satisfies General Studies Requirements: SB, H]*

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. May include field trips. Prerequisites: ECN 112; TXC 122, 223.

429 Textile Analysis. (3) F, S
Introduction to textile testing equipment and evaluation of data. 2 lectures, 3 hours lab. May include field trips. Prerequisite: TXC 323†.

523 Sociopsychological Aspects of Clothing. (3) N
Socio-psychological theories applied to the selection and use of clothing. Prerequisites: ECN 112; SOC 101; TXC 122.

524 Evolution of Costume. (3) N
Evolution of costume from ancient Egypt to 20th century. Individual investigation of certain periods and cultures. May include field trips. Not open to students with credit in TXC 424. Prerequisite: upper-division ARS course.

525 Costume in the 20th Century. (3) N
Cultural, decorative and functional influences on clothing. Individual investigation of certain periods and cultures. May include field trips. Not open to students with credit in TXC 425. Prerequisite: TXC 424.

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 111; two textile courses.

529 Experimental Textile Analysis. (3) N
Current textile research and methods. Individual projects relating to textile performance. May include field trip. Prerequisite: TXC 323.

Special Courses: TXC 294, 394, 484, 494, 498, 499, 500, *580, 584, 590, 591, 592, 593, 594, 598, 599.* *(See pages 36-37.)*

Foreign Languages

PROFESSORS:
HORWATH (LL B-404), ALARCON, ALEXANDER, CARLSON, COUCH, CURRAN, EKMANIS, FLYS, FOSTER, FRIEDMAN, GROBE, KELLER, VALDIVIESO, VIRGILLO, VOLEK

ASSOCIATE PROFESSORS:
AHERN, BALDINI, CARDENAS (ASU WEST CAMPUS), CARVER, COTA-CARDENAS, CROFT, GUNTERMANN, HENDRICKSON, KNOWLTON, LOSSE, RADKE, REIMAN, RIEGELHAUPT, RODD, SENNER, VASQUEZ, WIXTED, WOLLAM

ASSISTANT PROFESSORS:
ALLISON, BURTON, CACHEY, GRUZINSKA, LAETZ, LAFFORD, NIGRO, SIMMONS, TIPTON, WILLIAMS

INSTRUCTORS:
HABERMAN, MORGAN, OSSIPOV, TU

PROFESSORS EMERITI:
ACEVEDO, BININGER, BOWMAN, LANDEIRA, LOWE, LUENOW, MARTINEZ, SCHUBACK, SHEPPARD, VON DER HEYDT, WILSON, WIRTZ

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Asian Languages (Chinese or Japanese), French, German, Italian, Russian, Spanish. Consists of 45 semester hours, 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 81.)

Departmental Minor Requirements

Asian Languages (Chinese or Japanese), French, German, Italian, Russian, Spanish. Consists of 18 hours, of which 12 hours must be upper-division. Specific required courses for each area are listed in a brochure in the department.

Asian Studies Emphasis. Consists of the B.A. 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 85.)

Latin American Studies Emphasis. (See Latin American studies, page 86.) Consists of the B.A. 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 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 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 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 M.A. in French, German and Spanish, and the Ph.D. in Spanish. Consult the *Graduate Catalog* for requirements.

Foreign Languages for International Professions

The sequence of two semesters, listed under numbers 107 and 207 in four languages (Chinese, French, 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 semester hours in each of two semesters (ten hours weekly, for 10 semester hours in Chinese and Japanese).

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 semester 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 graduate 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 semester 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

The College of Liberal Arts and Sciences 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.

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 82.)

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 81.)

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 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; or (3) by achieving a grade of at least "C" in a course at the next higher level.

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 are expected to 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. *[Satisfies General Studies Requirements: HU, G]*

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). *[Satisfies General Studies Requirement: HU]*

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 instructor approval. *[Satisfies General Studies Requirements: HU, SB]*

401 Translation Theory and Practice. (3) N
Translation theories and professional practices and ethics; bibliography, computer technology and sample texts for natural and social sciences and humanities. Prerequisite: fourth-year composition or instructor approval 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 instructor approval. *[Satisfies General Studies Requirement: SB]*

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
(b) Chinese
(c) French
(d) German
(e) Greek
(f) Italian
(g) Japanese
(h) Latin
(i) Portuguese
(j) Russian
(k) Soviet
(l) Spanish
(m) Spanish-American

[Satisfies General Studies Requirements: HU, G, H]

425 Cultural Heritage. (3) F, SS
Aspects of political, intellectual, social, and artistic development of a foreign culture. Not for language majors except as a related-area course. Graduate students by permission.

460 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 and Sciences 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. *[Satisfies General Studies Requirement: SB]*

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 6 semester hours. 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 6 semester hours. Prerequisite: FLA 401 or instructor approval in the respective language area.

515 Second Language Acquisition. (3) S
Description and analysis of second language acquisition and learning simultaneously or sequentially in natural and artificial settings. Prerequisite: FLA 400 or equivalent, or instructor approval.

525 Trends and Issues in Foreign Language Teaching. (3) N
Advanced methods seminar, designed for experienced teachers.

Special Courses: FLA 294, 394, 484, 494, 497, 498, 499, 590, 591, 598. (See pages 36-37.)

CHINESE

CHI 101, 102 Elementary Chinese. (5) F, S
Pronunciation, grammar, elementary conversation, development of basic reading and writing skills. Standard dialect. 5 class hours.

107 Chinese for International Professions I. (10) F
Accelerated program alternative to CHI 101, 102 sequence. Functional approach to needs of international professions. Ten class hours.

201, 202 Intermediate Chinese. (5) F, S
Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. 5 class hours. Prerequisite: CHI 102† or equivalent. *[Satisfies General Studies Requirement: G]*

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. Ten class hours. Prerequisite: CHI 107 or instructor approval. *[Satisfies General Studies Requirement: G]*

309, 310, 311, 312 Chinese Conversation. (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† *[Satisfies General Studies Requirement: G]*

313, 314 Advanced Chinese. (3) F, S
The modern language in general, or specific areas depending on the student's needs or interests. 3 lectures plus arranged lab. Prerequisite: CHI 202† or equivalent. *[Satisfies General Studies Requirement: G]*

321, 322 Chinese Literature. (3) F, S
Selected representative works of the various genres and periods. Prerequisite: CHI 202† or instructor approval. *[Satisfies General Studies Requirement G]*

413, 414 Introduction to Classical Chinese. (3) F, S
Reading in various genres of pre-20th century literature (wen-yen), with analysis of the structure of the classical writings. Prerequisite: CHI 202† or equivalent.

Special Courses: CHI 294, 394, 492, 493, 494, 499, 590. (See pages 36-37.)

FRENCH

Any two of the 200-level courses may be taken in any order or simultaneously to satisfy the Liberal Arts and Sciences language requirements.

FRE 101, 102 Elementary French. (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. 4 lectures, 1 hour lab.

107 French for International Professions I. (8) F
Accelerated program alternative to FRE 101, 102 sequence. Functional approach to needs of international professions. Emphasis on speaking, understanding, writing and reading leading to communicative competence.

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. 4 lectures, 1 hour lab.

201 Intermediate Grammar Review. (4) F, S, SS
A thorough review of French grammar, including full attention to literary usage. 4 lectures. Prerequisite: FRE 102†, 111 or equivalent. *[Satisfies General Studies Requirement: G]*

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. 1 hour lab required. Prerequisite: FRE 102†, 111 or equivalent. *[Satisfies General Studies Requirement: G]*

205 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. *[Satisfies General Studies Requirements: HU, G]*

207 French for International Professions II. (8) S
Continuation of FRE 107, alternative to FRE 201, 203 sequence. Expansion of communicative proficiency in specific areas of international professions. Prerequisite: FRE 107 or instructor approval. *[Satisfies General Studies Requirement: G]*

311 French Conversation. (3) F, S
Further practice in speaking French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisites: FRE 203†, and 201† or 205†, or equivalents. *[Satisfies General Studies Requirement: G]*

312 French Composition. (3) F, S
Further practice in writing French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: 8 hours of 200-level French; or equivalent. *[Satisfies General Studies Requirement: G]*

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 instructor approval. *[Satisfies General Studies Requirement: G]*

321, 322 French Literature. (3) F, S
Representative masterpieces and significant movements of French literature. Prerequisites: FRE 205†, plus either FRE 203† or FRE 311†, or equivalents. *[Satisfies General Studies Requirements: L2, HU, H]*

410 French Phonetics and Diction. (2) F
Theory and practical application. Prerequisites: FRE 311†, 312†, or equivalents.

411 Advanced Spoken French. (3) F
Improvement of spoken French. Prerequisites: 9 hours of 300-level French, including FRE 311†, or equivalents. *[Satisfies General Studies Requirement: G]*

412 Advanced Written French. (3) S
Improvement of composition skills. Prerequisites: 9 hours of 300-level French, including FRE 312† or equivalents. *[Satisfies General Studies Requirement: G]*

415 French Civilization. (3) S
Political, intellectual, social, economic and artistic development of the French nation from its origins to the present. Prerequisite: 6 hours of upper-division French. *[Satisfies General Studies Requirements: HU, G]*

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: 9 hours of 300-level French, including FRE 321†, 322†, or instructor approval.

441 French Literature of the 17th Century. (3) F
From 1600 to 1660. Prerequisite: 9 hours of 300-level French including FRE 321†, or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

442 French Literature of the 17th Century. (3) S
From 1660 to 1700. Prerequisite: 9 hours of 300-level French, including FRE 321†, or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

445 French Literature of the 18th Century. (3) F
Contributions of the philosophers, development of the novel and drama. Prerequisite: 9 hours of 300-level French, including FRE 321†, or instructor approval. *[Satisfies General Studies Requirement: HU]*

451 French Poetry of the 19th Century. (3) S
From Romanticism to Parnassian poetry to Symbolism. Prerequisite: 9 hours of 300-level French, including FRE 322†, or instructor approval.

452 French Novel of the 19th Century. (3) S
From Constant, Hugo, Balzac, Stendhal, and Sand to Flaubert and Zola, with emphasis on major literary movements. Prerequisite: 9 hours of 300-level French, including

FRE 322†, or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

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: 9 hours of 300-level French, including FRE 322†, or instructor approval.

461 Pre-Atomic Literature. (3) N
Representative authors from Proust, Malraux to Sartre, from 1900 to 1945. Prerequisite: 9 hours of 300-level French, including FRE 322†, or instructor approval. *[Satisfies General Studies Requirement: HU]*

462 Post-Atomic Literature. (3) N
Representative authors including Camus, Duras and Robbe-Grillet, from 1945 to present. Prerequisite: 9 hours of 300-level French, including FRE 322†, or instructor approval. *[Satisfies General Studies Requirement: HU]*

471 The Literature of Francophone Africa and the Caribbean. (3) F '88
Selected prose, poetry and drama of Black authors from Africa and the Caribbean. Prerequisite: 9 hours of 300-level French including FRE 322†, or instructor approval. *[Satisfies General Studies Requirements: L2, HU]*

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) N
Significant social, aesthetic, philosophic, and scientific ideas as presented by major writers of fiction and non-fiction.

521 History of the French Language. (3) N
Principal phonological, morphological and semantic developments of French from its Latin origins to the present with emphasis on old and middle french. Prerequisite: some familiarity with Latin desirable.

531 Medieval French Literature. (3) F
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
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, Moliere 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 36-37.)

GERMAN

GER 101, 102 Elementary German. (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. 4 lectures, 1 hour lab.

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. 4 lectures, 1 hour lab.

201, 202 Intermediate German. (4) F, S, SS
Intensive review of grammar with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 lectures, 1 hour lab. Prerequisite: GER 102† or 111 or equivalent. *[Satisfies General Studies Requirement: G]*

303, 304 Scientific German. (3) F, S, N
Acquisition of a specialized vocabulary through the reading of German scientific publications. Prerequisite: GER 102† or 111.

311, 312 German Conversation. (3) F, S
Expansion of idiom through oral practice dealing with contemporary articles, essays, and stories. (3 semester hours limit for majors.) Prerequisite: GER 202† or equivalent. *[Satisfies General Studies Requirements: HU, SB, G]*

313 German Composition. (3) S
Intensive practice in writing, emphasizing style and grammar. Prerequisite: GER 202† or equivalent. *[Satisfies General Studies Requirements: HU, SB, G]*

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) N
Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: GER 313† or instructor approval. *[Satisfies General Studies Requirements: SB, G]*

321, 322 German Literature. (3) F, S
From the beginning to classicism and from romanticism to the present. Prerequisite: GER 202† or instructor approval. *[Satisfies General Studies Requirements: HU; SB, G (322)]*

411 Advanced Grammar and Conversation. (3) F
Improvement of diction and idiom through intensive oral review. Prerequisite: GER 311† or 312† or equivalent. *[Satisfies General Studies Requirements: G, HU, SB]*

412 Advanced Grammar and Composition. (3) S
Improvement of writing ability. Prerequisite: GER 313† or equivalent. *[Satisfies General Studies Requirements: G, HU, SB]*

415, 416 German Civilization. (3) F, S
Aspects of political, social and cultural life of the German-speaking world. Prerequisite: any 300-level course in German or instructor approval. *[Satisfies General Studies Requirements: SB, G, HU, H (415)]*

445 German Literature: Enlightenment to Classicism. (3) F, N
Major works of the literary epochs in the 18th century. Prerequisite: GER 321† or instructor approval.

451 German Literature: Biedermeier to Naturalism. (3) N
Representative works of prose and poetry from 1820 to 1890. Prerequisite: GER 322† or instructor approval.

461 Contemporary German Literature. (3) S
German writers since 1945. Prerequisite: GER 322† or instructor approval.

500 Bibliography and Research Methods. (3) F
Required of all graduate students.

511 German Stylistics. (3) F
Art of writing literary German, comparative stylistics.

521 History of German Language. (3) F
Linguistic development of German from the earliest records to the present.

523 German Drama. (3) N
Drama of the 19th and 20th centuries.

525 German Novel. (3) N
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
Reading and discussion of specimens of the Middle High German epics, romances, and other literary genres.

541 Baroque. (3) F, N
Studies in poetry, prose and drama of the 17th and early 18th centuries.

551 Romanticism. (3) S
Treatment of early and late Romanticism.

555 Modern German Literature. (3) SS
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	(e) Kafka
(b) Faust	(f) Hesse
(c) Schiller	(g) Grass and Boll
(d) Kleist	(h) Germanic Studies

Special Courses: GER 294, 394, 492, 493, 494, 498, 499, 590, 592, 598, 599. (See pages 36-37.)

GREEK

Completion of GRK 101, 201, 301, and 302 will satisfy the Liberal Arts and Sciences 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 instructor approval.

301, 302 Greek Literature. (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 instructor approval. *[Satisfies General Studies Requirement: HU]*

Special Courses: GRK 294, 394, 492, 493, 494, 499. (See pages 36-37.)

ITALIAN

ITA 101, 102 Elementary Italian. (4) F, S
Aural/oral drill in class and laboratory, and basic grammar supplemented by simple prose readings. 4 lectures, 1 hour lab.

201, 202 Intermediate Italian. (4) F, S
Intensive review of the fundamentals of Italian grammatical structure to increase the student's ability in composition, translation and idiomatic expression. 4 lectures, 1 hour lab. Prerequisite: ITA 102† or equivalent. *[Satisfies General Studies Requirement: G]*

311, 312 Italian Composition and Conversation. (3) F, S
Development of writing ability and oral expression. Prerequisite: ITA 202† or equivalent. *[Satisfies General Studies Requirement: G]*

314 Advanced Italian. (3) N
An advanced grammar and composition course with readings of selected literary works. Prerequisite: ITA 202 or instructor approval. *[Satisfies General Studies Requirements: HU, G, H]*

325 Introduction to Italian Literature. (3) F
Italian literature through the interpretation of representative works in drama, poetry and novel. Prerequisite: ITA 312† or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, G, H]*

430 Italian Literature of the Middle Ages. (3) N
Emphasis on "Stil Novo," Dante's minor works, Petrarch and Boccaccio. Prerequisite: ITA 325 or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

441 Dante: *Divina Commedia*. (3) N
Critical reading of the three *Cantiche (Inferno, Purgatorio, Paradiso)*. Prerequisite: ITA 325†. *[Satisfies General Studies Requirements: HU, H]*

443 Italian Literature of the Renaissance. (3) N
Emphasis on Lorenzo de'Medici, Poliziano Castiglione, Machiavelli, Ariosto and Tasso. Prerequisite: ITA 325 or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

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 instructor approval. *[Satisfies General Studies Requirements: HU, H]*

449 20th Century Italian Literature. (3) N
Major works, figures and movements of contemporary Italian literature. Prerequisite: ITA 325†. *[Satisfies General Studies Requirements: HU, G, H]*

Special Courses: ITA 294, 394, 492, 493, 494, 499. (See pages 36-37.)

JAPANESE

JPN 101, 102 Elementary Japanese. (5) F, S
Communication skills, basic grammar, basic reading and writing skills including hiragana, katakana, and about 250 kanji. 5 class hours.

107 Japanese for International Professions I. (10) F
Accelerated program alternative to JPN 101, 102 sequence. Functional approach to needs of international professions. Ten class hours.

201, 202 Intermediate Japanese. (5) F, S
Continued development of communication skills. Increased emphasis on reading and writing. Review of fundamentals of structure to increase student's abilities in composition and translation. 5 class hours. Prerequisite: JPN 102† or equivalent. *[Satisfies General Studies Requirement: G]*

206 Calligraphy. (1) N
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. Ten class hours. Prerequisite: JPN 107 or instructor approval. *[Satisfies General Studies Requirement: G]*

309, 310 Intermediate Japanese Conversation. (2) F, S
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†. *[Satisfies General Studies Requirement: G]*

311, 312 Japanese Conversation and Composition. (3) F, S
Intensive aural/oral practice leading toward conversational fluency. Practice in writing Japanese, emphasizing current usage. Prerequisite: JPN 202†. *[Satisfies General Studies Requirement: G]*

313, 314 Advanced Japanese. (3) F, S
Continued development of ability to communicate orally and in writing. Exposure to the variety of Japanese written styles. Prerequisite: JPN 202† or equivalent. *[Satisfies General Studies Requirement: G]*

321 Japanese Literature. (3) N
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 instructor approval. *[Satisfies General Studies Requirements: L2, G, H]*

414 Introduction to Classical Japanese. (3) S
Readings from various genres of pre-20th century literature, with analysis of the structure of the classical language. Prerequisite: JPN 313† or instructor approval. *[Satisfies General Studies Requirement: H]*

Special Courses: JPN 294, 394, 492, 493, 494, 499, 590. (See pages 36-37.)

LATIN

LAT 101, 102 Elementary Latin. (4) F, S
For beginning students only.

201, 202 Intermediate Latin. (4) F, S
Selected Latin literature, both classical and post-classical; Virgil's *Aeneid*; advanced grammar. Prerequisite: LAT 102† or instructor approval. *[Satisfies General Studies Requirement: HU]*

421, 422 Roman Literature. (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 instructor approval.

Special Courses: LAT 294, 394, 492, 493, 494, 499. (See pages 36-37.)

PORTUGUESE

Completion of POR 101, 201, 313, and 314 will satisfy the Liberal Arts and Sciences language requirements.

POR 101 Elementary Portuguese. (5) F
Basic grammar with intensive drill in class and laboratory directed toward conversational fluency. 5 lectures, 1 hour lab. Prerequisite: 1 year of Spanish, French, or Italian, or instructor approval.

201 Intermediate Portuguese. (5) S
Continuation of POR 101. Intensive drill of fundamentals in class and laboratory directed toward conversational fluency. 5 lectures, 1 hour lab. Prerequisite: POR 101 or instructor approval. *[Satisfies General Studies Requirement: G]*

313, 314 Portuguese Composition and Conversation. (3) F, S
Designed to develop skill in written Portuguese and corrected oral expression. Must be taken in sequence. Prerequisite: POR 201† or instructor approval. *[Satisfies General Studies Requirements HU, G]*

321 Luso-Brazilian Literature. (3) N
Representative masterpieces of Portuguese and Brazilian literature from the beginning to the present. Prerequisite: POR 313† or instructor approval. *[Satisfies General Studies Requirement: HU]*

472 Luso-Brazilian Civilization. (3) N
Lectures, readings and discussion of important aspects of Luso-Brazilian civilization. Topics from music, art, folklore, literature, history and politics. Prerequisite: POR 313† or instructor approval. *[Satisfies General Studies Requirements HU, G]*

Special Courses: POR 294, 394, 492, 493, 494, 499, 590. (See pages 36-37.)

RUSSIAN

RUS 101, 102 Elementary Russian. (4) F, S, SS
Structural grammar and basic vocabulary. Introduction and reinforcement of aural/oral reading and writing skills. 4 lectures, 1 hour lab.

201, 202 Intermediate Russian. (4) F, S, SS
Systematic review of grammar. Development of vocabulary through reading, writing. Drill in aural/oral skills. 4 lectures, 1 hour lab. Prerequisite: RUS 102† or equivalent. *[Satisfies General Studies Requirement: G]*

211, 212 Basic Russian Conversation. (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†. *[Satisfies General Studies Requirements: SB, G]*

303, 304 Scientific Russian. (3) F, S
Acquisition of scientific vocabulary through reading from current Soviet scientific publications. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree. Prerequisite: RUS 102†.

311, 312 Russian Composition and Conversation. (3) F, S
Development of writing ability and oral expression. Prerequisite: RUS 202†. *[Satisfies General Studies Requirements: SB, G]*

321, 322 Survey of Russian Literature. (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. *[Satisfies General Studies Requirements: L2, HU, H]*

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. *[Satisfies General Studies Requirements: L2, HU, G, H]*

411, 412 Advanced Composition and Conversation. (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†. *[Satisfies General Studies Requirements: SB, G]*

417, 418 Applied Russian Phonetics. (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 102†. *[Satisfies General Studies Requirement: SB]*

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 instructor approval. *[Satisfies General Studies Requirements: L2, HU, H]*

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 and Sciences language requirement for B.A. degree. *[Satisfies General Studies Requirements: L2, HU, H]*

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 and Sciences language requirement for B.A. degree. *[Satisfies General Studies Requirements: L2, HU, H]*

424 Tolstoy. (3) N
Tolstoy's major works, including *War and Peace* and *Anna Karenina.* Taught in English. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree. *[Satisfies General Studies Requirements: L2, HU, H]*

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 and Sciences language requirement for B.A. degree. *[Satisfies General Studies Requirements: L2, HU, H]*

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 instructor approval. *[Satisfies General Studies Requirements: L2, HU, G, H]*

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† or instructor approval. *[Satisfies General Studies Requirements: L2, HU, H]*

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 instructor approval. *[Satisfies General Studies Requirement: SB]*

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 instructor approval. *[Satisfies General Studies Requirements: HU, SB, G, H]*

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 36-37.)

SPANISH

SPA 101, 102 Elementary Spanish. (4) F, S, SS
Fundamentals of the language. Emphasis on listening, speaking, reading and writing. Not open to students with credit in SPA 111. 4 lectures, 1 hour lab.

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. 4 lectures, 1 hour lab.

201, 202 Intermediate Spanish. (4) F, S, SS
Continuation of fundamentals. Emphasis on the development of the skills of reading, listening comprehension, speaking, writing, and culture. 4 lectures, 1 hour lab. Prerequisite: SPA 102† or 111. *[Satisfies General Studies Requirement: G]*

203, 204 Intermediate Spanish for Bilinguals. (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. 4 lectures, 1 hour lab. Prerequisite: SPA 102† or 111 or placement. *[Satisfies General Studies Requirement: G]*

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 instructor approval. *[Satisfies General Studies Requirement: G]*

311, 312 Spanish Conversation. (3) F, S
Designed primarily for non-majors to promote vocabulary building and communicative expression in Spanish through discussions based on cultural readings. Prerequisite: SPA 202† or equivalent. *[Satisfies General Studies Requirement: G]*

313, 314 Spanish Conversation and Composition. (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. *[Satisfies General Studies Requirement: G]*

315, 316 Spanish Conversation and Composition for Bilinguals. (3) F, S
Emphasis on comparing standard Spanish with regional Southwest Spanish. May be taken in lieu of 313-314. Prerequisite: 202† or 204†; or instructor approval.

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 instructor approval. *[Satisfies General Studies Requirement: G]*

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†. *[Satisfies General Studies Requirement: HU]*

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 instructor approval. *[Satisfies General Studies Requirement G]*

413 Advanced Spanish Grammar. (3) F
Intensive analysis of the Spanish language. Required of teaching majors. Prerequisite: SPA 314† or 316† or instructor approval. *[Satisfies General Studies Requirement: G]*

417 Spanish Phonetics and Phonology. (3) F
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. *[Satisfies General Studies Requirement: SB]*

421 Spanish in the Southwest. (3) F
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 instructor approval. *[Satisfies General Studies Requirements: HU, SB]*

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†. *[Satisfies General Studies Requirements: L2, HU]*

425, 426 Spanish Literature. (3) F, S
Survey of Spanish literature from its beginning to the present. Prerequisite: SPA 325†. *[Satisfies General Studies Requirement: HU]*

427, 428 Spanish-American Literature. (3) F, S
Survey of major works, figures and movements from Colonial period to 1880 and from 1880 to present. Prerequisite: SPA 325†. *[Satisfies General Studies Requirement: G (428)]*

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
Dramatic works of Lope de Vega, Calderón de la Barca and their contemporaries. Prerequisite: SPA 325†.

435 Cervantes - *Don Quijote*. (3) F
Don Quijote and the development of the novel. Prerequisite: SPA 325†.

436 Generation of 1898. (3) S
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
Major trends in Spanish poetry from Modernism to present. Prerequisite: SPA 325†.

454 19th Century Spanish American Narrative. (3) F
Principal works in the novel, short story, narrative fiction and narrative (Gauchesque) poetry. Prerequisite: SPA 325†.

455 Spanish American Modernism. (3) S
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
Major works and movements. Prerequisite: SPA 325†.

457 Contemporary Spanish American Poetry. (3) F
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 Mexcan Americans, emphasizing socio-cultural as well as literary values. Prerequisite: SPA 325†. *[Satisfies General Studies Requirement: HU]*

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 instructor approval. *[Satisfies General Studies Requirements: HU, SB]*

472 Spanish-American Civilization. (3) F
Growth of the institutions and cultures of Spanish-American people. Prerequisite: SPA 314† or 316† or instructor approval. *[Satisfies General Studies Requirements: HU, SB, G, H]*

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 instructor approval. *[Satisfies General Studies Requirements: HU, SB, G]*

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 instructor approval.

486 Mexican American Novel. (3) N
Social and literary contexts of representative novelists, emphasizing their Spanish-language writings. Prerequisite: SPA 325† or instructor approval.

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 instructor approval.

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
The major dialects of Spanish in the Americas and their historical, social and cultural development. Prerequisite: SPA 540 or instructor approval.

542 Studies in the Spanish of the Southwest. (3) S
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
Analysis and discussion, within the framework of contemporary linguistic theories, of selected problems in Spanish morphology, syntax, and semantics. Prerequisite: FLA 400 or equivalent.

545 Concepts of Literary Criticism. (3) F
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 Galdos.

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, 600, 684, 692, 799. (See pages 36-37.)

Geography

PROFESSORS:
GOBER (COB 338), BRAZEL, BURNS, COMEAUX, GRAF, MARCUS, McTAGGART, WEIGEND
ASSOCIATE PROFESSORS:
ACKER, ALDRICH, MINGS, PASQUALETTI, SARGENT
ASSISTANT PROFESSORS:
BALLING, CERVENY, HENKEL, McHUGH, O'HUALLACHAIN, SHAW
PROFESSORS EMERITI:
DURRENBERGER, FROST, LOUNSBURY, PARKER

Departmental Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

Geography. Consists of 45 semester hours. The required courses are GCU 102, 121, 375, 495; GPH 111 (or 411), 371, 491; an additional 3- or 4-hour course in GPH; and an additional 3-hour course in GCU. 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.

Area Studies Emphasis. (See certificate programs, pages 85-86.) Consists of the B.A. requirements in Geography, along with additional requirements 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 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 optional. Students who wish to graduate with a B.A. or B.S. in Geography are not obligated to choose one of these emphases.

Urban Studies Emphasis. The required courses are GCU 102, 121, 357, 359 (or 360), 361, 375, 444, 495; and GPH 111 (or 411), 371, 491. In addition, students must select one from the following list of options: GCU 351, 364, 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, 121, 375 (or 495); GPH 212, 213, 214, 215, 371, 409, 410, 412, 413, 491. Students must also choose one other 3-hour course in GCU. Also required are the following related courses: MAT 270†, 271, 272 (or 290†, 291); PHY 111†, 112, 113 and 114. Completion of this program satisfies the criteria for employment with the National Weather Service.

Laboratory of Climatology

Dr. A. J. Brazel is drector of the Laboratory of Climatology and is Arizona's State Climatologist, a position formerly part of the National Weather Service of NOAA. The laboratory performs pure and applied climatic research and supports both undergraduate and graduate students at Arizona State University. The laboratory maintains an extensive archive of climatic and meteorologic information on Arizona and the western United States of America.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Geography. Consists of 45 semester hours, 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. Courses GCU 121 and GPH 111 (or 411) 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 M.A. and Ph.D. degrees. Consult the *Graduate Catalog* for requirements.

CULTURAL GEOGRAPHY

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. *[Satisfies General Studies Requirement: SB]*

121 World Geography. (4) F, S
Description and analysis of areal variations in social, economic and political phenomena in major world regions. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirements: SB, H]*

294 Special Topics. (4, 3) A
(a) Global Awareness *[Satisfies General Studies Requirements: SB, G]*
(b) Introduction to Southeast Asia *[Satisfies General Studies Requirement: G]*

322 Geography of Anglo-America. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in the United States and Canada. *[Satisfies General Studies Requirement: SB]*

323 Geography of Latin America. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in South, Middle and Caribbean America. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirement: SB]*

326 Geography of Asia. (3) S
Spatial distribution of relevant physical, economic and cultural phenomena in Asia, excluding the U.S.S.R. *[Satisfies General Studies Requirements: SB, G]*

327 Geography of Africa. (3) F
Spatial distribution of relevant physical, economic and cultural phenomena in Africa. *[Satisfies General Studies Requirements: SB, G]*

328 Geography of Middle East and North Africa. (3) A
Spatial distribution of relevant physical, economic and cultural phenomena in the Middle East and North Africa. Prerequisite: GCU 121 or instructor approval. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirements: SB, G]*

351 Population Geography. (3) S
Demographic patterns; spatial, temporal and structural investigation of the relationship of demographic variables to cultural, economic and environmental factors. *[Satisfies General Studies Requirement: SB]*

352 Political Geography. (3) S
Relationship between the socio-physical environment and the state. *[Satisfies General Studies Requirements: SB, G]*

357 Social Geography. (3) F
Environmental perception of individuals and groups. The spatial aspect of social and physical environments is stressed. *[Satisfies General Studies Requirement: SB]*

359, 360 Cities of the World. (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. *[Satisfies General Studies Requirement: G]*

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. *[Satisfies General Studies Requirement: SB]*

364 Geography of Energy. (3) F
Production, transportation and consumption of energy, emphasizing the electric power industry and its environmental problems. *[Satisfies General Studies Requirement: SB]*

375 Introduction to Geographic Research Methods. (3) F
Scientific techniques used in geographic research. Prerequisite: instructor approval.

401 Topics in Human Geography. (1-3) N
Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: instructor approval. *[Satisfies General Studies Requirement: SB]*

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

423 Geography of South America. (3) F
Prerequisite: GCU 323 or instructor approval. *[Satisfies General Studies Requirements: SB, G]*

424 Geography of Mexico and Middle America. (3) S
Central America and Mexico. Prerequisite: GCU 323 or instructor approval. *[Satisfies General Studies Requirements: SB, G]*

426 Geography of the Soviet Union. (3) S
Prerequisite: GCU 121 or instructor approval. *[Satisfies General Studies Requirements: SB, G]*

431 Geography of the Far East. (3) N
Japan, China, Korea, excluding the U.S.S.R. Prerequisite: GCU 326 or instructor approval.

441 Economic Geography. (3) F, S
Spatial distribution of primary, secondary and tertiary economic and production activities. Prerequisite: GCU 141 or instructor approval.

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. Prerequisite: GCU 361, 444† or instructor approval.

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.

474 Federal Public Land Policy. (3) S
Geographic aspects of federal public lands, policy, management, and issues. Emphasis on western wilderness and resource development problems.

495 Quantitative Methods in Geography. (3) S
Statistical techniques applied to the analysis of spatial distributions and relationships. Introduction to models and theory in geography. Prerequisite: MAT 106 or instructor approval.

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 instructor approval.

529 Contemporary Geographic Thought. (3) S
Comparative evaluation of current philosophy concerning the nature and trends of geography. Prerequisites: 15 hours of geography; instructor approval.

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 294, 484, 492, 494, 497, 498, 499, 500, 580, 584, 590, 591, 592, 594, 598, 599, 600, 680, 683, 684, 690, 691, 692, 700, 780, 784, 790, 791, 792, 799. (See pages 36-37.)

PHYSICAL GEOGRAPHY

GPH 111 Introduction to Physical Geography. (4) F, S
Spatial and functional relationships among climates, landforms, soils, water and plants. 3 lectures, 3 hours laboratory. Field trips are required. *[Satisfies General Studies Requirements: S1, S2]*

210 Physical Environment. (3) F
Principles of physical geography relating to environmental problems pertinent to contemporary society. Pollution, maladjusted land use, resource exploitation.

211 Landform Processes. (3) S
Geographic characteristics of landforms and earth-surface processes emphasizing erosion, transportation, deposition, and implications for human management of the environment. Prerequisite: GPH 111.

212, 213 Introduction to Meteorology I, II. (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 instructor approval. *[Satisfies General Studies Requirement: S2 (212)]*

214, 215 Introductory Meteorology Laboratory. (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. 3 hours lab. *[Satisfies General Studies Requirement: S2 (214)]*

271 Maps and Map Reading. (3) F
Techniques of interpretation of different types of maps and map projections; history of mapping. 2 lectures, 3 hours lab.

317 Marine Geography. (3) F, S
Spatial analysis of the physical characteristics and potential economic and cultural resources of the oceans. Prerequisite: GPH 111, 411, or instructor approval.

371 Cartography. (3) F, S
Basic map drafting, grid compilation, simple design and use of cartographic instruments. Field trips are required. 6 hours lab. Prerequisites: GPH 111, 271†; or instructor approval.

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†.

373 Cartographic Design. (3) A
Optimizing the communication of spatial information and concepts. Includes cartographic decision making, symbolism, perceptions, color, topography, projections, and scale. Prerequisite: GPH 371; instructor approval.

381 Geography of Natural Resources. (3) A
Nature and distribution of natural resources and the problems and principles associated with their use. *[Satisfies General Studies Requirement: SB]*

401 Topics in Physical Geography. (1-3) A
Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: instructor approval.

405 Energy and Environment. (3) S
Sources, regulatory and technical controls, distribution, and consequences of the supply and human use of energy. Prerequisite: courses in the physical or life sciences; or instructor approval. *[Satisfies General Studies Requirement: SB]*

409, 410 Synoptic Meteorology I, II. (4) F '89, S '90
Diagnostic techniques and synoptic forecasting. Includes practical operation of field stations and techniques of weather analysis. Field trips are required. 3 lectures, 3 hours lab. Prerequisite: GPH 212†, 213† or instructor approval.

411 Physical Geography. (3) A
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) A
Physical processes in the earth-atmosphere system on regional and global scales; concepts and analysis of energy, momentum and mass balances. Prerequisites: GPH 212†, 213† or 310†; or instructor approval.

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. Prerequisites: GPH 212†, 213†; or instructor approval.

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 instructor approval.

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 instructor approval.

471 Geographic Information Systems. (3) A
GIS as a basis for microcomputer spatial analysis and synthesis. Includes digitizing, database organization, spatial retrieval, and graphics. Prerequisite: instructor approval.

474 Dynamic Meteorology I. (3) F '88
Large-scale atmospheric motion, kinematics, Newton's laws, wind equation, baroclinics, vorticity, the mid-latitude depression. Prerequisites: GPH 212, 213, 214, 215, 310 (or 311); MAT 270, 271; PHY 111, 112; or instructor approval.

475 Dynamic Meteorology II. (3) S '89
Topics in climate dynamics. General circulation, numerical modeling, teleconnection phenomena, surface-atmosphere interaction. Prerequisite: GPH 474 or instructor approval.

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: instructor approval.

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: instructor approval.

511 Fluvial Processes. (3) A
Geographic aspects of fluvial geomorphology with emphasis on river channel change, fluvial erosion, and sedimentation in the present environment. Prerequisites: GLG 101 (or GPH 111), 362 (or GPH 211).

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†; instructor approval.

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: GCU 585 (or GPH 491†); GPH 372†.

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 36-37.)

Geology

PROFESSORS:
GREELEY (PS F-686), BURT, BUSECK, HOLLOWAY, KNAUTH, KRINSLEY, LARIMER, LUNDIN, MALIN, MOORE, RAGAN, SHERIDAN, STUMP
ASSOCIATE PROFESSOR:
FINK
ASSISTANT PROFESSORS:
CHRISTENSEN, PEACOCK, SMITH, TYBURCZY
PROFESSORS EMERITI:
DIETZ, MILLER, PÉWÉ

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Geology. 37 semester hours are required, including the following "core courses" or their equivalent: GLG 100 (or 101 and 103; or 301), 104, 310†, 321†, 322, 400 (2 semesters) and 450†. In addition, three of the following four "branch courses" must be taken: 335†, 418†, 424†, 435†. It is strongly recommended that the fourth branch course is also taken. Supporting courses required in related fields are CHM 113†, 116; MAT 290†, 291 (or 270†, 271, 272; or 270†, 271, 274†); PHY 115†, 116, 117, 118. To complete the total required hours, other courses in geology or in related fields listed as approved by the department may be taken. GLG 472 cannot be used to fulfill the requirements for a major. French, German, or Russian is strongly recommended to fulfill foreign language requirement. (See degree requirements, page 81.)

Bachelor of Arts in Education Degree Curriculum

Departmental Teaching Major

Geology. Consists of 42 semester hours of which a minimum of 30 will be in geology. The following courses in geology or their equivalents are required: GLG 100 (or 101 and 103), 102, 310, 321†, 322, 335, 336, 362† (or 435†). Additional courses and substitutions that are necessary to complete the major will be selected from geology and closely related fields as approved by the student's advisor. Supporting courses required in related fields are: CHM 113†, 116; MAT 270†; PHY 111†, 112, 113, 114.

Departmental Teaching Minor

Twenty-four semester hours will be selected from courses below. The following courses or their equivalent are recommended for a teaching minor in geology (earth science): GLG 100 (or 101), 102, 103. Any of the following courses or their equivalent may be used to complete a minor in geology (earth science): GLG 310, 321†, 322, 335, 336, 362†, 400, 424†, 435 and 436. Any substitutions for the above courses must be approved by the advisor.

Departmental Graduate Programs

The Department of Geology offers programs leading to the M.S. and Ph.D. degrees. Consult the *Graduate Catalog* for requirement.

GEOLOGY

GLG 100 General Geology. (4) F, S, SS
Nonlaboratory introduction to physical and historical geology. The earth, its origin, processes that affect it, sequence of events in its evolution and succession of life upon it. GLG 100 and 101 may not both be taken for credit. Possible field trips.

101 Introduction to Geology. (3) F, S
Basic principles of geology. Geology, geochemistry, and geophysics in relation to materials and processes acting upon and within the earth's crust. Rocks, minerals, weathering, earthquakes, mountain building processes, volcanoes, running water, ground water and glaciers. 3 lectures. Possible weekend field trips. *[Satisfies General Studies Requirements: S1, S2]*

102 Historical Geology and Modern Problems. (3) S
Basic principles of applied geology and the use of these principles in the interpretation of geologic history. 3 lectures. Possible weekend field trips. Prerequisite: GLG 101. *[Satisfies General Studies Requirement: S2]*

103 Introduction to Geology Laboratory. (1) F, S
Three hours lab. Some field trips. Corequisite: GLG 101. *[Satisfies General Studies Requirements: S1, S2]*

104 Historical Geology and Modern Problems Laboratory. (1) S
Laboratory techniques involving map interpretation, cross sections, fossils. 3 hours lab. Possible field trips. Prerequisite: GLG 103, or equivalent. Corequisite: GLG 102. *[Satisfies General Studies Requirement: S1]*

105 Introduction to Planetary Science. (3) F
Planets, asteroids, comets and meteorites: their geological evolution, surfaces, interior, atmospheres, exobiology. Terraforming and space colonies.

300 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. Majors who have taken GLG 101 for credit may not enroll.

301 Geology for Engineers. (3) N
Physical geology emphasizing structural geology, ground water and relation of geology to engineering problems. 2 lectures, 3 hours lab. Some field trips during lab.

302 Man and Geologic Environment. (3)
Geologic hazards, problems of waste disposal and land-use planning, environmental problems related to solid earth.

303 Geology of Arizona Laboratory. (1) F, S
Laboratory for GLG 300, 2 hours. Weekend field trip to Grand Canyon.

304 Geology of the Grand Canyon. (2) N
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 6 days after commencement in May) required at student's expense. Field research and term paper on trip also required.

305 Geology of the Earth, Moon and Planets. (3) S
Geological studies of the planets and satellites through the analysis of spacecraft data, and field studies. Weekend field trips. Prerequisites: GLG 100, 101, 105, 300; or equivalent.

310 Structural Geology. (3) S
Geologic structures and the mechanical processes involved in their formation. 2 lectures, 3 hours lab. Possible field trips. Prerequisites: MAT 270† or 290†; GLG 101 or 301.

321 Mineralogy. (3) F
Crystallography, crystal chemistry and crystal physics as applied to minerals; determinative methods; origin and occurrence. 3 lectures, possible field trips. Prerequisite: MAT 270 or 290. Prerequisite: MAT 270 or 290. Pre- or corequisite: CHM 116†. Corequisite: GLG 322.

322 Mineralogy Laboratory. (2) F
Hand specimen identification, polarizing microscopy, optical techniques. 6 hours lab. Corequisite: GLG 321†.

335 Principles of Paleontology. (2) F
Emphasis on preservation, growth, species concept, and evolution as demonstrated by the fossil record. 2 lectures. Prerequisites: MAT 270† or 290†; GLG 102† or instructor approval.

336 Invertebrate Paleontology. (3) F
Biology, skeletal morphology and systematics of fossil invertebrates. 6 hours of lab-lecture. Possible field trips. Prerequisite: GLG 102† or instructor approval. Pre- or corequisite for geology majors: GLG 335.

362 Geomorphology. (3) N
Land forms and processes which create and modify them. Laboratory and field study of physiographic features. 2 lectures, 3 hours lab. Some field trips during lab; possible weekend field trips. Prerequisites: GLG 101, 310†, 424† or concurrent enrollment.

400 Geology Colloquium. (1) F, S
Presentation of recent research by faculty and guests. Written assignments required. One semester hour for 2 semesters' attendance. One semester hour required for geology majors; may be repeated for a total of 2 semester hours (4 semesters). Prerequisite: Two courses in the department or instructor approval.

405 Geology of the Moon. (3) N
Current theories of the origin and evolution of the moon through photogeological analyses and consideration of geochemical and geophysical constraints. Possible weekend field trip. Prerequisite: GLG 105 or 305 or instructor approval.

406 Geology of Mars. (3) N
Geological evolution of Mars through analyses of spacecraft data, theoretical modelling, and study of terrestrial analogs; emphasis on current work. Possible weekend field trip. Prerequisite: GLG 105 or 305 or instructor approval.

412 Geotectonics. (3) F
Origin of continents and ocean basins. Evolution of the crust in time. Drifting, sea floor spreading and other large-scale movements of the earth's crust. Upper mantle processes. Emphasis on current work. Prerequisite: GLG 310†.

418 Geophysics. (3) F
Solid earth geophysics; geomagnetism, gravity, seismology, heat flow, emphasizing crust and upper mantle. 2 lectures, 3 hours lab. Field trips during lab; possible weekend field trips. Prerequisites: GLG 101 or 301; MAT 272† or 291†; PHY 115†, 116; or instructor approval.

419 Thermal-Mechanical Processes in the Earth. (3) S
Emphasis on applied mathematical techniques, heat conduction problems in geology, thermal convection, stresses in the lithosphere, viscoelastic processes in the Earth. Prerequisites: PHY 115†, 116†.

420 Volcanology. (3) A
Distribution of past and present volcanism, types of volcanic activity, mechanism of eruption, form and structure of volcanoes, geochemistry of volcanic activity. Possible weekend field trips. Prerequisite: GLG 424†.

424 Petrology-Petrography. (4) S
Theoretical and laboratory study of the origin and classification of igneous and metamorphic rocks. Hand specimen and thin-section study of rocks. 3 lectures, 3 hours lab. Possible weekend field trips. Prerequisites: GLG 321†, 322†.

425 Advanced Optical and Analytical Techniques. (3) F
Applied crystallography and mineralogy using transmitted and reflected light microscopy, x-ray diffraction and fluorescence techniques, and introduction to other analytical methods applied to minerals. 2 lectures, 3 hours lab. Prerequisite: GLG 424†.

435 Sedimentology. (3) S
Origin, transport, deposition and diagenesis of sediments and sedimentary rocks. Physical analysis, hand specimen examination and interpretation of rocks and sediments. 2 lectures, 3 hours lab. Possible weekend field trips. Prerequisites: GLG 102, 321†, 322†.

436 Principles of Stratigraphy. (3) S
Sources of sediments, depositional environments and the principles in delimiting, correlating and naming of stratigraphic units. 3 lectures. Possible weekend field trips. Prerequisites: GLG 102†, and instructor approval.

441 Ore Deposits. (3) N
Origin, occurrence, structure and mineralogy of ore deposits. 3 lectures. Possible weekend field trips. Prerequisite: GLG 424† or instructor approval.

446 Ground Water Geology. (3) N
Principles governing the occurrence, movement, quality, classification and recovery of underground water, with special reference to Arizona. Possible field trips. Prerequisite: GLG 435†.

450 Geology Field Camp. (6) SS
Geological mapping techniques on aerial photos and topographic maps. Field based with excursions. Prerequisites: GLG 310†, 321†.

455 Advanced Field Geology. (4) F, S
Geologic mapping in igneous, sedimentary, and metamorphic terrains of the Basin and Range province of Arizona. Weekend field trips. May be repeated for credit. Prerequisite: GLG 450† or instructor approval.

456 Cordilleran Regional Geology. (3) F
Systematic coverage through space and time of the geological development of Western North America, emphasizing the Western United States. Prerequisite: senior major or graduate student in geology or instructor approval.

462 Environmental Geology of Cold Regions. (3) N
Geological and engineering importance of seasonal and perennially frozen ground (permafrost). Properties, distribution, origin of ice in the ground and its application to engineer-

ing and land utilization problems. Possible weekend field trips. Prerequisites: GLG 101, 435†; PHY 111† and 113†, or instructor approval.

472 Earth Science. (3) F, S
Principles of earth science and their influence in forming the scenic features on the surface of the earth. GLG 472 cannot be taken for credit by one who has 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. Cross-listed as CHM 481. Prerequisites: CHM 341† or 441† or GLG 321†.

485 Meteorites and Cosmochemistry. (3) N
Chemistry of meteorites and their relationship to the origin of the earth, solar system and universe. Cross-listed as CHM 485. Prerequisite: GLG 481† or 482†.

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. May be repeated for credit. Prerequisite: instructor approval.

500 Geology Colloquium. (1) F, S
Presentation of recent research by faculty and invited guests. One semester required for all geology graduate students. May be repeated for total of 2 semesters. Research paper required. Prerequisite: instructor approval.

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. 3 lectures. Research paper required.

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. 6 day field trip down the river (first 6 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. Possible field trips. Prerequisites: GLG 310†, 424† or instructor approval.

520 Advanced Physical Volcanology. (3) A
Selected volcanologic topics, including explosive eruption processes, lava flow mechanics, and intrusive mechanisms. Field trips possible. Prerequisite: GLG 420† or instructor approval.

523 Advanced Mineralogy-Crystallography. (3) S
Crystallography, principles of X-ray and electron diffraction, defects in crystals, electron microscopy of minerals. 3 lectures. Prerequisite: 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. 2 lectures, 3 hours lab. Possible weekend field trips. Prerequisite: GLG 424†.

525 Advanced Metamorphic Petrology. (3) N
Theoretical and laboratory study of metamorphic rocks. Processes of contact and regional metamorphism. Advanced methods and instrumentations. 2 lectures, 3 hours lab. Possible weekend field trips. Prerequisite: GLG 424†.

550 Advanced Field Mapping. (4) F, S
Geologic mapping of areas with complex structural or facies relationships. 4 weekend excursions. Course may be taken more than once for credit. Prerequisite: GLG 450† or instructor approval.

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. 2 lectures, 3 hours lab. Some field trips during lab; possible weekend field trips. Prerequisite: GLG 362†.

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. 2 lectures, 3 hours lab. Some field trips during lab; possible weekend field trips. Prerequisite: GLG 362† or instructor approval.

581 Isotope Geochemistry. (3) N
Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Cross-listed as CHM 581. Prerequisite: instructor approval.

582 Physical Geochemistry. (3) N
Application of thermodynamic and kinetic principles to geochemical processes. Cross-listed as CHM 582. Prerequisite: CHM 341, 417† or 441† or GLG 321†.

583 Phase Equilibria and Geochemical Systems. (3) N
Natural reactions at high temperatures and pressures; silicate, sulfide and oxide equilibria. Cross-listed as CHM 583. Prerequisites: GLG 582†; instructor approval.

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, 497, 498, 499, 590, 591, 592, 593, 598, 599, 690, 691, 692, 783, 790, 791, 792, 799. (See pages 36-37.)

Health and Physical Education

PROFESSORS:
PANGRAZI (PEBW M-201), CORBIN, CORDER, DARST, KRAHENBUHL, LANDERS, ODENKIRK, OSTERHOUDT, SHIRREFFS (ASU WEST CAMPUS), SKINNER, STONE, WELLS

ASSOCIATE PROFESSORS:
BURKETT, DEZELSKY

ASSISTANT PROFESSORS:
CUSIMANO, GRIER, HINRICHS, LARISH, MARTIN, MYERS, TRAN, VAN DER MARS, VOGLER

INSTRUCTOR:
HILGERS

PROFESSORS EMERITI:
BRYANT, DEACH, KAJIKAWA, KLANN, MAARSINGH, McFARLAND, MURPHY, PACKER, PITTMAN, RICHARDSON, STEVERSON, STEWART, THOMSON, WEGNER, WULK

Departmental Major Requirements

All Department of Health and Physical Education majors are required to complete a core sequence in physical education (21 semester hours: PED 110, 335, 340, 345, 450 and 494); a MAT class (three semester hours: 106, 115, 117 or 141); either a HIS class (3 semester hours: 100, 101 or 102), or a PHI class (3 semester hours); and ZOL 201 and 202 (8 semester hours). All PED courses must be completed with a minimum grade of "C."

Bachelor of Science Degree Curriculum

Candidates for the B.S. may elect to study either in an exercise and sport studies option or in a fitness leadership option.

Exercise and Sport Studies Option. Candidates must complete 24 semester hours in the major field, at least 9 of which must carry PED prefixes, be upper-division experiences and concern the theoretical subjects of the core. The remaining 15 semester hours may carry either PED prefixes or prefixes from related disciplines selected with the advice and consent of a faculty advisor. No more than 3 of these 15 semester hours may be in activity courses which must be different from those taken in the core, and no more than 6 may be in independent study courses.

Fitness Leadership Option. Candidates must complete 24 semester hours in the major field; PED 325, 420, 425 (3 semester hours each), PED 484 (3-6 semester hours), and 12 semester hours carrying either PED prefixes or prefixes from related disciplines selected with the advice and consent of a faculty advisor. No more than 3 of these 12 hours may be in activity courses which must differ from those taken in the core, and no more than 6 may be in independent study courses.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Candidates for the B.A. are required to complete 19 additional semester hours in physical education (PED 110, 361, 375, 376, 382 and 483) and a four-semester professional sequence in the College of Education (32 semester hours). Entry into this degree program requires passing scores on a Pre-Professional Skills Test (PPST), 56 semester hours of completed university study and a 2.50 grade point average. (See the College of Education for additional requirements.)

Departmental Minor Teaching Field Requirements

(Secondary Education)

Coaching of Athletics (Men and Women). Consists of 32 semester hours. Courses PED 335†, 340†, 346, 383† and 486†; ZOL 201, 202 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 semester hours. Courses FON 241; HES 100; PED 270†, 335, 340, 382, 383†, 485, 486; PGS 100; ZOL 201, 202 are required; plus electives selected by the student in consultation with an advisor. Note: Six (6) semester hours or two years' equivalent work of 600 clock hours of internship. Contact Intercollegiate Athletic Department to enroll in this program.

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 (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 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) N
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) N
Examination of consumer behavior in the health marketplace. Emphasis on systems of healing, health insurance, quackery and product safety.

340 School Health. (3) N
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) N
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) N
Analysis of research in various disciplines which contribute to health education. Primarily for prospective health teachers and public health educators. Prerequisites: HES 100, 382; 6 semester hours in social and behavioral sciences.

382 Introduction to Public Health. (3) N
Public and community health is examined including governmental, voluntary and community agency activities which promote health among populations.

400 Health and Aging. (3) N
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) N
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) N
Principles of environmental health, involving management of ecosystems and their relationship to public and community health.

480 Methods of Teaching Health. (3) N
Techniques and materials for health instruction. Prerequisites: HES 100, 360, 361, 382; health education major or minor.

482 Advanced Public Health. (3) N
Theory and concepts of public health practice. Program planning, implementation and evaluation applied to a diversity of public health problems. Prerequisites: HES 340, 480.

483 Supervised Field Training. (3-6) N
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. May be repeated for a total of 9 hours. Prerequisite: 24 hours of required health science courses.

501 International Health. (3) N
A systematic comparison of the factors that affect public health on a global basis.

502 Health Problems of the Southwest. (3) N
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) N
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) N
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.

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.

Special Courses: HES 394, 484, 494, 498, 499, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

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. 3 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. May be repeated, in different sports, for credit. Prerequisite: physical education major.

170 Introduction to Physical Education. (1) F, S, SS
Orientation to and exploration of the field of physical education, to be taken in the freshman year. First Aid certificate required prior to completion of class. 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. 3 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, 202†.

290 Sports Officiating. (3) F
Rules and mechanics of officiating used in football, basketball and volleyball.

291 Theory of Coaching. (3) F, S
Theory of coaching competitive sports. Each class meets 3 hours per week. Prerequisite: physical education major and coaching minor; or approval of area chair.

292 Sports Officiating. (3) S
Rules and mechanics of officiating used in softball (slow and fast pitch), baseball, and track and field.

305 Physical Education Activity. *(1) F, S*
Advanced levels. Continuation of PED 205. Includes Red Cross Senior Life Saving, Red Cross Water Safety Instructorship. 3 hours a week. May be repeated for credit. Prerequisite: current Senior Red Cross Life Saving Certificate, and other aquatic activities.

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 semester hours. 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
Basic mechanical and anatomical principles applied to human movement. Emphasis is placed on kinematic and kinetic concepts. Prerequisites: MAT 115 or 117 or 141; ZOL 201.

340 Physiology of Exercise. (3) F, S, SS
Nature and scope of physiological responses and adaptations to exercise in the human body. Prerequisite: ZOL 202†.

345 Motor Learning. (3) F, S, SS
Principles of information processing and learning and their relationship to understanding the performance and learning of motor skills. Prerequisite: PGS 100.

346 Psychology of Coaching. (3) F, S, SS
Principles of learning applied to coaching sports. Psychological and social problems of coaching. Prerequisite: PGS 100.

348 Psychological Skills for Optimal Performance. (3) F, S
Application of psychological techniques and their use to improve effectiveness and performance in sport and related areas.

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.

375 Movement Concepts and Experiences for Children. (3) F, S, SS
Introduction to basic movement concepts, activities and experiences related to physical education for elementary-aged children.

376 Physical Education for the Elementary School. (3) F, S, SS
Scope and values of physical 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
Survey course of handicapping conditions and adapting activities to meet the needs of the handicapped. Prerequisite: PED 335† or instructor 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. Designed for students seeking NATA certification. Prerequisite: PED 283.

420 Exercise Testing. (3) F
Theoretical basis and practical application of screening, exercise testing, estimates of energy expenditure and interpretation of results. Prerequisite: PED 340.

425 Exercise Prescription. (3) S
Theoretical bases for and application of general principles of exercise prescription to various ages, fitness levels and health states. Prerequisite: PED 420.

450 History and Philosophy of Physical Education. (3) F, S, SS
Nature, purpose and development of sporting and related activity from ancient primitive to twentieth-century civilization.

480 Methods of Teaching Physical Education. (3) F, S
Methods of instruction, organization and presentation of appropriate content in elementary and secondary physical education. Concurrent with student teaching or permission of instructor.

483 Evaluation in Physical Education. *(3) F, S, SS*
Analysis and construction of tests. Statistics as applied to tests and measurement in school-based and nonschool-based settings.

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. Designed for students seeking NATA certification. Prerequisite: PED 383.

486 Coaching/Athletic Training Internship. (1-6) F, S
Relationship of theory of coaching athletics and athletic training techniques to practical application of coaching and/or athletic training techniques. "Y" grade only. Prerequisite: approval by discipline chair.

500 Research Methods. (3) F
An introduction to the basic aspects of research, including problem selection, literature review, instrumentation, data handling, methodology and the writing of research reports and articles.

501 Research Statistics. *(3) S*
Statistical procedures; sampling techniques; exercise testing, exercise prescription, hypothesis testing and experimental designs as they relate to studies reported in research publications. Prerequisite: PED 340.

505 Research Laboratory. (3) F
Advanced research techniques in use and calibration of laboratory equipment utilized in cinematographic analysis, cardiorespiratory testing and motor learning experimentation.

510 Introduction to Biomechanics Research Methods. (3) F
Application of mechanics to human movement analysis. Includes consideration of motion analysis techniques, segment inertial properties and data processing methods.

520 Psychology of Exercise and Sport. (3) F
Current research in psychology of exercise, motor learning/control and sport psychology. Includes psychophysiological and behavioral research techniques. Prerequisite: PED 345 or 346.

530 Exercise Physiology. (3) F
Immediate and long-term adaptations to exercise with special reference to training and the role of exercise in cardiovascular health.

534 Sports Conditioning. (3) F
Bases of sports conditioning, including: aerobic and anaerobic power, strength, flexibility, analysis of conditioning components for sports.

536 Fitness Program Development. (3) S
Planning, organization and administration of fitness programs. Exercise testing and prescription. Programs for special groups.

542 Environmental Aspects of Human Performance. (3) N
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. Prerequisite: PED 530.

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 Preschool Children. (3) SS, N
Movement activities for pre-schoolers based on the needs and characteristics of young children.

610 Biomechanics. (3) S
Advanced topics in biomechanics research including imaging techniques, sampling theory, kinetics and muscle mechanics; evaluation of current research literature. Prerequisite: PED 510 or instructor approval.

620 Psychomotor Development. (3) S, SS
Analysis and discussion of current research results including theoretical models for conducting research. Prerequisites: PED 500, 501, 520.

621 Motor Learning. (3) F
Discussion of contemporary research issues in motor learning and control. Includes behavioral and neurophysiological issues. Prerequisite: PED 520, 521 or equivalent.

622 Sport Psychology. (3) S, SS
Contemporary research and theory as related to human performance in sport and exercise settings. Prerequisites: PED 500, 501, 520.

Special Courses: PED 394, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599, 680, 683, 684, 690, 691, 692, 780, 783, 784, 790, 791, 792, 799. (See pages 36-37.)

History

PROFESSORS:
TRENNERT (SS 204), BARLOW, BURG, GIFFIN, HUBBARD, IVERSON (ASU WEST CAMPUS), KLEINFELD, LUCKINGHAM, PAULSEN, TAMBS, WARNICKE

ASSOCIATE PROFESSORS:
ADELSON, BATALDEN, DELLHEIM, FRANKLIN, FULLINWIDER, KAHN, KEARNEY, MacKINNON, PYNE (ASU WEST CAMPUS), ROSALES, ROTHSCHILD, R. D. SMITH, STOWE, TILLMAN, WOOTTEN

ASSISTANT PROFESSORS:
CARROLL, FUCHS, GRATTON, HURTADO, L. C. SMITH, STONER, STROCCHIA, SUTTON, VANDERMEER, WEINER

LECTURER:
LUEY

PROFESSORS EMERITI:
DANNENFELDT, KARNES, PHILLIPS, SACKS, TILDEN, YOUNG

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

History. Consists of 45 semester hours of which 30 must be in history and 15 in related fields to be approved by the advisor in consultation with the student. HIS 498 (Pro-Seminar) is required, except

for honors students who may substitute HIS 493 (Honors Thesis). 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 81.)

Latin American Studies Emphasis. (See Latin American studies, page 86.) Consists of the B.A. requirements in History. At least 30 upper-division semester 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 Asian studies, page 85.) Consists of the B.A. 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 42 semester hours in history (including HIS 381 and 382) and 18 hours in closely related fields and quantitative studies, as approved by the program directors in consultation with the student. HIS 381 and 382 are required for all degree candidates and should be completed, in sequence, by the end of the junior year. Related fields' courses may also be used to satisfy general CLAS requirements. 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 81.)

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

History. Consists of 42 semester hours, 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 semester hours 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 495 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 semester hours 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 M.A. and Ph.D. degrees. Consult the *Graduate Catalog* for requirements.

HISTORY

Courses listed in pairs or triplicate may be taken in any order.

HIS 100, 101, 102 Western Civilization. (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. *[Satisfies General Studies Requirements: SB, H; G (102)]*

103, 104 The United States. (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. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirement: G]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

271 European Jewish History. (3) N
European Jewish experience from the Crusades to the emancipation of the Jews in the 18th and early 19th centuries.

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. *[Introduction to Southeast Asia Satisfies General Studies Requirement: G]*

303, 304 American Cultural History. (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. *[Satisfies General Studies Requirements: SB, H]*

305, 306 Asian Civilizations. (3) F, S
The civilizations of China, Japan and India. The second semester may also include Southeast Asia. First semester, to mid-17th century; second semester, mid-17th century to present. *[Satisfies General Studies Requirements: SB, G, H]*

320 Ancient Greece. (3) A
History and civilization of the Greek world from the Bronze Age to the Roman conquest of the Hellenistic kingdoms. *[Satisfies General Studies Requirements: SB, H]*

321 Rome. (3) A
History and civilization of Rome from the beginning of the Republic to the end of the Empire. *[Satisfies General Studies Requirements: SB, H]*

322, 323 The Middle Ages. (3) A
Political, socio-economic and cultural developments of Western Europe. First semester, Early Middle Ages; second semester, High Middle Ages. *[Satisfies General Studies Requirements: SB, H]*

324 Renaissance. (3) F
Antecedents and development of the Renaissance in Italy and its spread to the rest of Europe. *[Satisfies General Studies Requirements: SB, H]*

325 Reformation. (3) S
The Protestant and Catholic Reformation in the 16th century. *[Satisfies General Studies Requirements: SB, H]*

326, 327 Early Modern Europe. (3) A
Social, economic, cultural and political changes in 17th and 18th century Europe. First semester, 17th century; second semester, 18th century. *[Satisfies General Studies Requirements: SB, H]*

329, 330 19th Century Europe. (3) A
Political, social, economic and intellectual currents in Europe from Napoleon through World War I. First semester, 1815-1866; second semester, 1866-1918. *[Satisfies General Studies Requirements: SB, H]*

331, 332 20th Century Europe. (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. *[Satisfies General Studies Requirements: SB, G, H]*

333 Women and Society in Europe. (3) N
Women's role, status and achievements in Europe, 1750-1950. Changes in everyday life, sex roles, family patterns, work and culture. *[Satisfies General Studies Requirements: HU, SB, H]*

351, 352 England. (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. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

363, 364 The Black American Experience. (3) A
The Afro-American in American history, thought and culture. First semester, slavery to 1865; second semester, from 1865 to the present. *[Satisfies General Studies Requirements: SB, H (364)]*

365 Islamic Civilization. (3) F
An interdisciplinary survey of art, history and religion in Islamic civilization. Cross-listed as REL 365. *[Satisfies General Studies Requirements: HU, SB, G, H]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

367, 368 The West in American History. (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. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

370 Women in United States History, 1600-1880. (3) F
Examination of lives of American women and women's social organizations. *[Satisfies General Studies Requirements: SB, H]*

371 Women in United States History, 1880- 1980. (3) S
Examination of lives of American women and women's social organizations. *[Satisfies General Studies Requirements: SB, H]*

373, 374 United States Military History. (3) F, S
The implementation of American foreign and domestic policies by strategic means. First semester: Colonial foundations to the Civil War. Second semester: America as a world power. Prerequisites: HIS 103 and 104. *[Satisfies General Studies Requirements: SB, H; G (374)]*

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. *[Satisfies General Studies Requirements: SB, H]*

381 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 115 or 117.

382 Historical Statistics. (3) A
Historical data analysis: sampling distributions, tests of hypotheses, t-tests to multiple regression, nonparametric

techniques. Prerequisite: HIS 381. *[Satisfies General Studies Requirement: N2]*

383, 384 Latin America. (3) A
First semester, ancient civilization, explorers and conquerors, and colonial institutions; second semester, nationalistic development of the independent republics since 1825. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

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 postwar America. *[Satisfies General Studies Requirements: SB, H]*

407 The Emergence of Modern America. (3) A
The triumph of modern political, social and economic structures and values, 1870-1918; role of region, religion, race and ethnicity. *[Satisfies General Studies Requirements: SB, H]*

409, 410 Recent American History. (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. Prerequisite: HIS 104 or equivalent. *[Satisfies General Studies Requirements: SB, H]*

411 Contemporary America. (3) A
The United States from 1945 to the present. *[Satisfies General Studies Requirements: SB, H]*

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. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

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. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

415, 416 American Diplomatic History. (3) A
American relations with foreign powers. First semester, 1776-1898; second semester, 1898 to the present. Prerequisite: 415–HIS 103 or instructor approval; 416–HIS 104 or instructor approval. *[Satisfies General Studies Requirements: SB, H; G (416)]*

417, 418 Constitutional History of the United States. (3) N
Origin and development of the American constitutional system. First semester, colonial origins through Reconstruction; second semester, Reconstruction to the present. Prerequisite: 417–HIS 103 or instructor approval; 418–HIS 104 or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

419, 420 American Urban History. (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. *[Satisfies General Studies Requirements: SB, H]*

421 History of American Labor. (3) A
American workers, from the colonial period to the present, including farmers, slaves, housewives, the skilled and unskilled, unionized and nonunionized. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

422 Social History of American Women. (3) A
Examination of women's social position in America. In-depth analysis of specific women's issues in terms of change over time. *[Satisfies General Studies Requirements: SB, H]*

423 Recent American Intellectual History. (3) A
Major movements in 20th century science, religion and philosophy. *[Satisfies General Studies Requirements: SB, H]*

424 The Hispanic Southwest. (3) N
Development of the Southwest in the Spanish and Mexican periods to 1848. *[Satisfies General Studies Requirements: SB, H]*

425 The American Southwest. (3) N
Development of the Southwest from 1848 to the present. *Satisfies General Studies Requirements: SB, H]*

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. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

428 Arizona. (3) A
Emergence of the state from early times to the present. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

429 Metropolitan Phoenix. (3) A
Historical development of the Phoenix Metropolitan area since the 19th century.

430 20th Century Chicano History. (3) A
Historical development of the Chicano community in the 20th century. *[Satisfies General Studies Requirements: SB, H]*

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. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

433 Modern France. (3) A
Social, political, economic and cultural transformations of French society, 1815-present. Impact of industrialization, war and revolution on people's lives. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, G, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

435 Modern Germany. (3) A
Germany since 1840. *[Satisfies General Studies Requirements: SB, G, H]*

437, 438 Eastern Europe and the Balkans. (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. *[Satisfies General Studies Requirements: SB, H; G (438)]*

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. *[Satisfies General Studies Requirements: SB, H]*

442 The Soviet Union. (3) A
An examination of Soviet politics, economic development and foreign relations from the 1917 Revolution to the present. *[Satisfies General Studies Requirements: SB, G, H]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

445 Tudor England. (3) A
Political, social, economic and cultural developments in 16th century England. *[Satisfies General Studies Requirements: SB, H]*

446 Stuart England. (3) A
Political, social, economic and cultural developments in 17th century England. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

451 The British Empire. (3) A
British imperialism and colonialism in Africa, the Americas, Asia and the South Pacific. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

452, 453 Economic History of Europe. (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. *[Satisfies General Studies Requirements: SB, H; G (453)]*

454, 455 Intellectual History of Modern Europe. (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. Prerequisite: upper-division standing or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

456, 457 History of Spain. (3) N
Cultural, economic, political and social development of Spain. First semester, earliest days to 1700. Second semester, 1700 to the present. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirements: SB, H]*

460, 461 Spanish South America. (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. *[Satisfies General Studies Requirements: SB, G, H]*

466, 467 Mexico. (3) A
Political, economic, social and cultural developments. First semester, earliest times to 1810; second semester, 1810 to the present. *[Satisfies General Studies Requirements: SB, H]*

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) 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. *[Satisfies General Studies Requirements: SB, H; G (470)]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

472 The United States and China. (3) N
Emphasis on viewing from both sides the roller coaster ride of cultural, political and economic relations in the 20th century. *[Satisfies General Studies Requirements: SB, G, H]*

473, 474 China. (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. *[Satisfies General Studies Requirements: SB, H; G (474)]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

476 Modern Southeast Asia. (3) N
Imperialism and revolution in 19th and 20th century Southeast Asia. *[Satisfies General Studies Requirements: SB, H]*

477, 478 Japan. (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. *[Satisfies General Studies Requirements: SB, H; G (478)]*

479 The Chinese Communist Movement. (3) N
Analysis of the communist movement in 20th century China, with emphasis on its historical setting. *[Satisfies General Studies Requirements: SB, G, H]*

481 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. *[Satisfies General Studies Requirements: SB, G, H]*

485 Historic Preservation. (3) N
Comparative approach to preservation of historic resources in Europe and United States; analysis of regulatory framework and case studies.

495 Methods of Teaching History. (3) S
Methods in instruction, organization and presentation of the subject matter of history and closely allied fields.

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 Publishing Procedures I. (3) 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. (3) 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. (3) 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).

525 Historical Resource Management. (3) F
Identification, documentation and interpretation of historic period buildings, sites and districts. Emphasis on interdisciplinary efforts among historians, architects and anthropologists.

526 Historians and Preservation. (3) S
Preparation of historians for public and private historic preservation programs. Prerequisite: HIS 525 or instructor approval.

527 Historical Administration. (3) F
Preparation of historians in administration of archives, historical sites, historical museums, historical societies and historical offices in government agencies.

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 36-37.)

Interdisciplinary Humanities Program

PROFESSOR/DIRECTOR:
Bettie Anne Doebler

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 toward 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, 301, 302, or 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 Architecture, Art, Anthropology (Cultural), Dance, English, Foreign Languages, History, Music, Philosophy, Religious Studies and Theatre. Twelve additional hours of supporting courses in consultation with the advisor are recommended especially to broaden the student's historic and aesthetic understanding. They are to be selected from the following disciplines: architecture, 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 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. *[Satisfies General Studies Requirements: HU, G, H]*

301, 302 Humanities in the Western World. (4) F, S
Interrelation of arts and ideas in Western Civilization. HUM 301, Hellenic through Medieval; 302, Renaissance to the present. 3 lectures, 1 discussion meeting per week. *[Satisfies General Studies Requirements: HU, H]*

413 Comedy: Meaning and Form. (3) S
Nature and characteristics of comedy in the literary, fine and performing arts. Prerequisites: HUM 301, 302; or equivalent. *[Satisfies General Studies Requirement: HU]*

414 Tragedy: Meaning and Form. (3) A
Nature and characteristics of literary and artistic expressions called tragic. Prerequisites: HUM 301, 302; or equivalent. *[Satisfies General Studies Requirement: HU]*

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 six hours credit when topics vary. *[Interpretation of Culture Satisfies General Studies Requirement: H]*

501 Interpretation of Cultures. (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 six hours credit, when topics vary.

Additional courses may be selected from cultural anthropology, architecture, art, communication, dance, foreign languages and English (literature), cultural geography, intellectual and cultural history, journalism and telecommunication, music, philosophy and theatre.

Special Courses: HUM 294, 394, 492, 493, 494, 497, 499, 590, 591, 592, 598, 599. (See pages 36-37.)

Liberal Arts

Interdisciplinary (LIA) courses offered by the College of Liberal Arts and Sciences.

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. Prerequisite: freshman or sophomore; or instructor approval.

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) 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. *[Satisfies General Studies Requirements: L1, HU, H]*

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, dance, foreign languages and English (literature), cultural geography, intellectual and cultural history, journalism and telecommunication, music, philosophy and theatre.

Special Courses: LIA 294, 298, 394, 484, 492, 493, 494, 497, 498, 499. (See pages 36-37.)

Mathematics

PROFESSORS:
TROTTER (PS A-216), ANDERSON, BUSTOZ, BYRNES, FELDSTEIN, GOLDSTEIN, GRACE, HERRERO, IHRIG, ISMAIL, JACOBOWITZ, KELLY, LEONARD, McDONALD, MITTELMANN, NERING, RODMAN, SAVAGE, SHERMAN, H. A. SMITH, H. L. SMITH, L. SMITH, A. WANG, C. WANG, WEISS, YOUNG

ASSOCIATE PROFESSORS:
BEDIENT, BREMNER, DRISCOLL, FARMER, HASSETT, HELTON, KADELL, KUIPER, KURTZ, MOORE, QUIGG, RINGHOFER, SANSONE, STEWART, SWIMMER

ASSISTANT PROFESSORS:
LISKOVEC, McCARTER, PECK, RENAUT, TAYLOR

PROFESSORS EMERITI:
FREUND, LAKE, NIEMEIR, SINKOV

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Mathematics. Consists of a minimum of 30 semester hours in mathematics and additional course work in closely related fields, to be approved by the advisor, for a total of at least 45 semester hours. The required courses must include CSC 100† (or 183†); MAT 219, 270†, 271, 272, 274, 342, 371 (or 460); and two 400-level mathematics courses to be approved by the advisor. 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.

Bachelor of Science Degree Curriculum

Mathematics. Consists of a minimum of 42 semester hours in mathematics and additional course work in closely related fields, to be approved by the advisor, for a total of at least 55 semester hours. The required hours must include CSC 100† (or 183†); MAT 270†, 271, 272 and 342. To satisfy the remaining required hours the following options are available:

General mathematics option. Requires MAT 219, 274, 371, 372, 410 (or 415, 443 or 445), 461 (or 462 or 475); STP 421; and 3 more hours in mathematics to be approved by the advisor. The department recommends a one-year sequence in some closely related field.

Computational mathematics option. Requires CSC 100-101 (or CSC 300 with approval of advisor), 220 (or 310); MAT 243, 274, 371, 464, 465, 467; STP 326 (or 420 or 421). The remaining hours are to include 3 upper-division courses, at least two of which must be in mathematics including one at the 400-level and all of which must be approved by the advisor.

Applied mathematics option. Requires MAT 274, 371, 372, 419 (or IEE 473), 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 CSC 101; IEE 476†; MAT 415, 416, 419, 443, 463, 465, 472, 475; and STP 421, 425, 427.

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) IEE 473†, 476†; MAT 419. The remaining courses in mathematics, to be approved by the advisor, may be selected from the three groups above or from among CSC 101; MAT 464, 465, 466; STP 420, 429. 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 CSC 100 (or 181); MAT 219 (or 243), 270, 271, 272, 310, 342, 371, 443 (or 445); MTE 483; and STP 420. 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 96) or physics (page 147). The mathematics portion of this 60-hour program consists of 30 semester hours 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. 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 M.A. and Ph.D. degrees. Consult the *Graduate 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: 1 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: 3 semesters of high school algebra or MAT 106†. *[Satisfies General Studies Requirement: N1]*

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: 3 semesters of high school algebra or MAT 106†. *[Satisfies General Studies Requirement: N1]*

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. *[Satisfies General Studies Requirement: N1]*

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. *[Satisfies General Studies Requirement: N1]*

205 The Creative Art of Mathematics. (3) N
Topics chosen to illustrate the historical and conceptual development of mathematics. Prerequisite: MAT 106 or equivalent.

210 Brief Calculus. (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: MAT115†, 117† or 141†; or equivalent. *[Satisfies General Studies Requirement: N1]*

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: 1 semester of calculus or instructor approval. *[Satisfies General Studies Requirement: N1]*

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 instructor approval. *[Satisfies General Studies Requirement: N1]*

243 Discrete Mathematical Structures. (3) F, S, SS
Introduction to lattices, graphs, Boolean algebras and groups, with emphasis on topics relevant to computer science. Prerequisite: sophomore standing or instructor approval.

260, 261 Technical Calculus I, II. (3) F, S, SS
Analytic geometry, differential and integral calculus of elementary functions emphasizing physical interpretation and problem solving. MAT 260 is not open to students with credit in MAT 210, 270, or 290. Prerequisite for 260: MAT 115† or

equivalent. Prerequisite for 261: MAT 260† or instructor approval. *[Satisfies General Studies Requirement: N1 (260)]*

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. *[Satisfies General Studies Requirement: N1]*

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. 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. *[Satisfies General Studies Requirement: N1]*

291 Calculus II. (5) F, S
Further applications of calculus, partial differentiation, multiple integrals and infinite series. Prerequisite: MAT 290† or equivalent.

310 Introduction to Geometry. (3) 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†, 362†; or equivalent.

371 Advanced Calculus I. (3) F, S
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. Pre- or corequisite: 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. Cross-listed as CSC 457. 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 chosen from: transport networks, matching theory, block designs, coding theory, Polya's counting theory and applications to the physical and life sciences. Prerequisite: MAT 415† or instructor approval. MAT 443† is recommended.

419 Linear Programming. (3) S
Linear programming and the simplex algorithm, network problems, quadratic and nonlinear programming. Prerequisite: 1 semester of college calculus. *[Satisfies General Studies Requirement: N2]*

431 Foundations of Mathematics. (3) N
Topics from mathematical logic and set theory. May be repeated for credit with instructor approval. Prerequisite: MAT 342† or instructor approval.

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 instructor approval.

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
A detailed study of one or more mathematical models which occur in the physical or biological sciences, May be repeated for credit with instructor approval. Prerequisites: MAT 242† or 342†, 274†; or instructor approval. *[Satisfies General Studies Requirement: N2]*

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 242† or 342†, 274†.

461 Applied Complex Analysis. (3) F, SS
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) N
Fourier, Laplace and other transforms; applications to boundary value problems; generalized functions and modern operational mathematics. Prerequisite: instructor approval.

464 Numerical Analysis I. (3) F
Theory and methods for: numerical solution of algebraic and transcendental equations; iteration methods; approximation; quadrature; solution of differential equations. Those seeking a methods survey course should take MAT 466. Prerequisites: fluency in computer programming (preferably Fortran); MAT 342†, 371†; or instructor approval. *[Satisfies General Studies Requirement: N3]*

465 Numerical Analysis II. (3) S
Continuation of MAT 464. Prerequisite: MAT 464†. *[Satisfies General Studies Requirement: N3]*

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); MAT 271† or equivalent; or instructor approval. *[Satisfies General Studies Requirement: N3]*

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. Prerequisite: CSC 101†, 200†, or 383†; or MAT 464† or 466†; or instructor approval. *[Satisfies General Studies Requirement: N3]*

472 Intermediate Real Analysis. (3) F
Topology of the real line, sequences and series of functions, uniform covergence and the Riemann-Stieltjes integral. Prerequisite: MAT 372 or instructor approval.

475 Differential Equations. (3) S
Asymptotic behavior of solutions of linear and non-linear 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) N
Topics from the history of the origin and development of mathematical ideas. Prerequisite: MAT 272† or equivalent.

510, 511 Point Set Topology. (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 instructor approval.

543, 544 Abstract Algebra. (3) F, S
Groups, modules, rings and fields, Galois theory, homological algebra, representation theory. Prerequisite: MAT 443† or instructor approval.

550 Variational Methods. (3) F
Calculus of variations and its applications to extremal problems, classical mechanics and partial differential equations. Prerequisites: MAT 274, 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, 462; or equivalent.

560 Numerical Linear Algebra. (3) A
Direct solution of linear systems, iterative methods, eigenvalues and eigenvectors, singular value decomposition, the QR algorithm, error propagation, arithmetic, stability. Prerequisites: MAT 342, 464 (or 466); or instructor approval.

561 Numerical Optimization. (3) N
Linear programming, unconstrained nonlinear minimization, line search algorithms, conjugate gradients, quasi-Newton methods, constrained nonlinear optimization, gradient projection, penalty methods. Prerequisites: MAT 342 and/or 371 or 460 or equivalents; or MAT 560; or instructor approval.

564, 565 Advanced Numerical Analysis. (3) F, S
Finite difference equations, orthogonal polynomials, quadrature, approximation and integration theory, numerical solution of differential equations, numerical linear algebra. May be repeated for credit with instructor approval. Prerequisite: MAT 464† or instructor approval.

566 Numerical Solution of Ordinary Differential Equations. (3) N
One step, multistep, one-leg, shooting and collecation methods; discretization and rounding errors; stability, stiff problems. Prerequisite: MAT 464 or 466; or instructor approval.

567 Numerical Solution of Partial Differential Equations. (3) N
Parabolic, hyperbolic and elliptic equations, difference methods, finite and boundary elements, method of characteristics, stability, consistency, convergence, nonlinear problems, applications. Prerequisites: MAT 371 (or 460 or 462), 464 (or 466); or instructor approval.

568 Numerical Solution of Boundary Value Problems. (3) N
Difference methods, finite element methods, defect correction, irregular meshes, nonlinear problems, bifurcation, boundary layers, sparse systems. May be repeated for credit with instructor approval. Prerequisites: MAT 371 (or 460 or 462), 464 (or 466); or instructor approval.

569 Topics in Analysis. (3) N
May be repeated for credit with instructor approval. Prerequisite: instructor approval.

570, 571 Real Analysis. (3) S, F
Lebesgue integration, selected function spaces, differentiation, abstract measure theory, elements of functional analysis. Prerequisite: MAT 372† or instructor approval.

572, 573 Complex Analysis. (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 instructor approval.

574, 575 Theory of Ordinary Differential Equations. (3) N
Systems, existence proofs, singularities, asymptotic behavior of solutions, boundedness of solutions, eigenvalues and eigenfunctions, perturbation theory. Prerequisite: MAT 372† or instructor approval.

576, 577 Theory of Partial Differential Equations. (3) N
Existence and uniqueness theorems, boundary value and initial value problems, characteristics, Green's functions, maximum principle, distributions and weak solutions. Prerequisite: knowledge of Lebesgue integration or instructor approval.

578, 579 Functional Analysis. (3) N
Locally convex, normed and Hilbert spaces. Linear operators, spectral theory and application to classical analysis. Prerequisite: MAT 472† or 571†; or instructor approval.

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 36-37.)

MATHEMATICS EDUCATION

MTE 180, 181 Theory of Elementary Mathematics. (3) F, S, SS
Number systems, intuitive geometry, elementary algebra and measurement. Intended for prospective elementary school teachers. Prerequisite for 180: MAT 106 or equivalent. Prerequisite for 181: MTE 180 or instructor approval.

380 Arithmetic in the Elementary School. (3) A
Historical numeration systems, overview of elementary number theory including primes, factorization, divisibility, bases, modular systems, linear congruence and continued fractions. Prerequisite: MTE 181† or instructor approval.

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 instructor approval.

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 instructor approval.

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 instructor approval.

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: instructor approval.

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 instructor approval.

582 Modern Mathematics for Teachers. (3) A
Theory of sets, real number system, transfinite numbers and other selected topics. Prerequisite: instructor approval.

583 Abstract Algebra for Teachers. (3) A
Postulational approach to algebra, elementary mathematical systems including groups and fields. Prerequisite: instructor approval.

584 Teaching College Mathematics. (3) A
Methods and learning difficulties in the teaching of lower-division college mathematics courses. Prerequisite: instructor approval.

585 Modern Geometry for Teachers. (3) A
Euclidean, projective and non-Euclidean geometries. Prerequisite: instructor approval.

587, 588 Analysis for Teachers. (3) N
Subject matter in mathematics appropriate for accelerated programs in secondary schools, including analytic geometry and calculus. Prerequisite: instructor approval.

Special Courses: MTE 294, 298, 492, 493, 494, 498, 499, 590, 591, 592, 594, 598, 599, 792, 799. (See pages 36-37.)

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: 3 semesters of high school algebra or MAT 106†. *[Satisfies General Studies Requirement: N2]*

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. *[Satisfies General Studies Requirement: N2]*

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 equivalent. *[Satisfies General Studies Requirement: N2]*

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 MAT 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: MAT 342† and STP 421†.

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. *[Satisfies General Studies Requirement: N3]*

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: MAT 571†; STP 421†; or instructor approval.

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†; 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 test, 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 36-37.)

Microbiology

PROFESSORS:
_____ (LS C-210), REEVES, SCHMIDT
ASSOCIATE PROFESSORS:
BIRGE, BURKE, LEATHERS
ASSISTANT PROFESSORS:
HOFFMAN, JACOBS, SCHREIER, SWAFFORD
PROFESSORS EMERITI:
JOHNSON, NORTHEY

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Microbiology. Consists of a minimum of 41 semester hours in microbiology and approved related fields. Students majoring in Microbiology are required to take the following courses: BIO 181, 182, 340; CHM 231 (or 331, 332, 335, 336), 361, 367; MIC 206, 220, 302, 360, 420, 470, 494 (1 credit); plus a minimum of 5 semester hours of upper-division electives in microbiology or approved related fields. The 5 hours must include one laboratory course. In addition, the students are required to fulfill the university numeracy requirement with one course chosen from MAT 210, 270, 290 (or STP 420) and with one course chosen from CSC 100, 181, or any class having those courses as a prerequisite. The required supplemental courses are: CHM 113†, 115, 225, 226; PHY 111†, 112, 113, 114.

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 take 41 hours of clinical laboratory sciences courses. Also required are CHM 113, 231, 361; MIC 205, 206, 420; ZOL 360. Students must consult with the clinical laboratory sciences advisor to select general electives courses. Completion of the degree is dependent upon acceptance of the student into the accredited professional study program which consists of 40 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 Microbiology offers programs leading to the degrees of Master of Natural Science, Master of Science and Doctor of Philosophy. Consult the *Graduate Catalog* for requirements.

MICROBIOLOGY

MIC 205 Microbiology. (3) F, S, SS
Basic course for non-majors emphasizing general principles of the role of micro-organisms in health, ecology and related applied fields. Prerequisites: CHM 101 and one of the following: BIO 100; BOT 108; or instructor approval. *[Satisfies General Studies Requirement: S2]*

206 Microbiology Laboratory. (1) F, S, SS
Principles and laboratory techniques used in identifying and handling micro-organisms. 3 hours lab. Pre- or corequisite: MIC 205 or 220. *[Satisfies General Studies Requirement: S2]*

220 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 205. Prerequisites: BIO 182; CHM 115†.

302 Advanced Bacteriology Laboratory. (2) F
Advanced laboratory techniques in bacterial growth, physiology, genetics, microscopy and basic virology. Required of microbiology majors. 4 hours lab. Prerequisites: either group A or B: (A) MIC 206, 220; or (B) MIC 205, 206; instructor approval. *[Satisfies General Studies Requirement: L2]*

360 Bacterial Physiology. (3) F
Mechanisms and control of cell metabolism, structures and functions. Prerequisites: MIC 220. Pre- or corequisite: CHM 331 or instructor approval.

380 Plant Pathology. (3) F '89
Biotic and abiotic agents of disease, including field observations and methods of control. Prerequisite: BOT 360 or instructor approval.

420 Introductory Immunology. (3) F
Fundamental concepts in research and medicine. Cellular immunity, antibody and antigen, immunogenetics, immunoregulation, hypersensitivity, clinical immunology, nervous-immune system interactions. Prerequisites: CHM 231 or 331; MIC 205 or 220; or instructor approval.

421 Experimental Immunology. (2) F, S
An introduction to the basic techniques, methods and assays used in immunology. 6 hours lab. Prerequisites: CHM 231†, 331†; MIC 302†; or instructor approval.

425 Advanced Immunology. (3) S
A survey of recent advances in immunology including: lymphocyte membranes, lympokines/biochemistry, molecular genetics, theoretical immunology, immunoregulation, neuroimmunology, immunologic diseases. Prerequisite: MIC 420 or instructor approval.

434 Medical Mycology. (3) S
Fungi as causal agents of diseases of man, including pathology and epidemiology, emphasizing techniques of diagnosis. 2 lectures, 3 hours lab. Prerequisite: MIC 206 or equivalent.

441 Bacterial Genetics. (3) S '89
Survey of genetic exchange and regulatory processes in bacteria and their viruses. Bacteria and viruses as tools in genetic engineering. Prerequisites: BIO 340; MIC 205† or 220; or instructor approval.

442 Bacterial Genetics Laboratory. (1) S '89
Techniques of mutagenesis, mapping and strain construction. 4 hours lab. Prerequisites: MIC 206. Pre- or corequisite: MIC 441†.

470 Systematic Bacteriology. (3) S
Classification and identification of bacteria. 1 lecture, 6 hours lab. Prerequisites: MIC 206; 5 hours of microbiology.

481 Pathogenic Microbes. (3) F
Host-microbial interactions in infectious disease, with emphasis on pathogenesis, host defenses and molecular mechanisms of microbial virulence. Prerequisites: 6 hours of microbiology; CHM 231† or 331†.

485 General Virology. (3) F
Fundamental nature of viruses, their replication, pathogenesis and ecology. Prerequisites: BIO 340; CHM 331; or instructor approval.

486 General Virology Laboratory. (2) F
An introduction to the growth, assay and detection of viruses. 6 hours lab. Prerequisite: MIC 302. Pre- or corequisite: MIC 485.

494 Special Topics: Research Paper. (1) F, S, SS
A paper of 15 or more pages based on library or laboratory research in collaboration with a faculty member. *[Satisfies General Studies Requirement: L2]*

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

545 Recombinant DNA Methodology. (3) F
Principles of genetic engineering using in vitro DNA recombination; characteristics of plasmid and phage vectors; recombinant selection and physical characterization. Prerequisites: BIO 443; MIC 441; instructor approval.

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

560 Microbial Enzymology. (3) N
Discussion of techniques and methods for the assay, isolation and characterization of microbial enzymes and the utilization of these methods in the laboratory. 2 lectures, 3 hours lab. Prerequisites: 5 hours of microbiology; CHM 331 or equivalent; instructor approval.

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

591 Seminar. (1-3) F, S
Topics may be selected from the following:
(a) Molecular Biology
(b) Virology
(c) Enzymology
(d) Genetics
(e) Genetic Engineering
(f) Immunology
(g) Neuroimmunology
(h) Bacterial Ecology
(i) Pathogenic Bacteriology

Special Courses: MIC 298, 484, 492, 493, 494, 497, 498, 499, 500, 590, 591, 592, 598, 599, 700, 790, 791, 792, 799.
(See pages 36-37.)

CLINICAL LABORATORY SCIENCES

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

300 Clinical Laboratory Instrumentation. (3) F
Principles, structure and application of clinical laboratory instruments, including electronics, spectrophotometric analysis, quality control, laboratory mathematics and automated analysis. 2 lectures, 3 hours lab. Prerequisite: CHM 115†; PHY 101; or equivalents.

Enrollment for the following C.L.S. classes is restricted to students admitted to the Clinical Laboratory Sciences Professional Study Program.

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. 3 lectures, 9 hours lab.

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. 3 lectures, 9 hours lab.

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. 2 lectures, 3 hours lab.

410 Principles of Clinical Chemistry II. (2) SS
Continuation of Clinical Chemistry I with emphasis on principles of automation, laboratory computers and method evaluation. 1 lecture, 3 hours lab.

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. 1 lecture, 3 hours lab.

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. 2 lectures, 3 hours lab.

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. 3 lectures, 3 hours lab.

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) F, 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.

Military Science

(Army ROTC)

PROFESSOR:
STANDRIDGE (MAIN 240)
ASSISTANT PROFESSORS:
CROSSON, DEFRANCO, ENGSTROM, GIBBONS, LARSON, LECHLER
PROFESSORS EMERITI:
LAPE, SPARKS

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

Basic Course. Any student who is enrolled in Arizona State University (or approved by a professor of military science) can enter into the military science basic course. It is strongly recommended that they be in sound physical shape as some of the curriculum requires physical exertion.

Advanced Course. Any student who is enrolled in Arizona State University (or approved by a professor of military science) may enroll in the military science advanced course. However, to be competitive and obtain a commission in the United States Army, students must meet the following requirements:

1. Be a citizen of the United States (non-citizens may enroll but must obtain citizenship prior to commissioning).
2. Be of sound physical condition and pass the U.A. Army physical fitness standards.
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. Only those students in the basic and advanced courses who meet required military regulations are eligible to receive financial assistance through the United States Army. Members of the Department of Military Science are available at all times during normal office hours to answer questions or provide counseling.

The following are various options that are open to students who wish to obtain a commission in the United States Army. (Contact a professor of military science for more information.)

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 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 at least sophomore status (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 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, attainment of at least sophomore class standing 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.

Military Construction Option. The Department of Military Science and the Department of Construction of the College of Engineering and Applied Sciences have jointly developed a new degree option entitled "military construction." It is comprised of 70% technical studies and 30% electives in the areas of planning, management and organization. It is distinctly military in orientation and is designed to prepare graduates to plan, manage and direct large-scale construction projects, such as roads, dams, air fields, bridges and other public works. ROTC cadets enrolled in this program receive credit toward the degree for all military science courses (18 semester hours). Upon completion of the 132 hour program, cadets will graduate with a Bachelor of Science in Construction .

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 toward 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 four years to as little as three months. Scholarship students have up to 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. 2 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. 1 lecture-conference, 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. 2 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. 1 lecture-conference, 1½ hours of Leadership Practical Application.

205 ROTC Basic Camp. (4) SS
Six-week training program emphasizing practical hands-on skills and leadership development. Taken in lieu of MIS 101, 102, 203 and 204. Conducted at Fort Knox, Kentucky.

301 Advanced Military Science. (3) F
Theory and dynamics of the individual soldier and military units in offensive combat operations. Two lectures-conferences, 1½ hours of Leadership Practical Application, one 2-day field exercise; three 1-day field exercises. Prerequisites: MIS 101, 102, 203, 204; or equivalent.

302 Advanced Military Science. (3) S
Theory and dynamics of military units in defensive combat operations. Two lectures-conferences, 1½ hours Leadership Practical Application, one 3-day field exercise; two 1-day field exercises. Prerequisites: MIS 101, 202, 203, 204; or equivalent.

303 ROTC Advanced Camp. (4) SS
Six-week training program emphasizing leadership development and advanced military skills to include: tactics, land navigation and physical training. Conducted at Fort Lewis, Washington. Prerequisites: MIS 301, 302.

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. 2 lectures-conferences, 1½ hours Leadership Practical Application, one 2-day field exercise; three 1-day field exercises. Prerequisites: MIS 301†, 302†.

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. 2 lectures, 1½ hours Leadership Practical Application, one 3-day field exercise; two 1-day field exercises. Prerequisites: MIS 301†, 302†.

Philosophy

PROFESSORS:
FITCH (PS A-521), CARNEY, HUMPHREY, MURPHY, WHITE
ASSOCIATE PROFESSORS:
CREATH, GIESCHEN, GULESERIAN, LIU, MAIENSCHEIN
ASSISTANT PROFESSORS:
HOWELLS, KOBES, SNOW
PROFESSORS EMERITI:
ARNER, REIN'L, VOTICHENKO

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Philosophy. The major in Philosophy consists of 45 semester hours. 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 PHI 400-level courses not to include 492, 493 or 499, except with special permission of the chair. A minor in Philosophy consists of 18 semester hours, of which at least 12 must be upper-division level and approved by an advisor in the Philosophy Department. 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 81.)

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 Catalog* for requirements.

PHILOSOPHY

Philosophy majors who take cross-listed 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. *[Satisfies General Studies Requirement: HU]*

103 Principles of Sound Reasoning. (3) F, S, SS
Fallacies, validity and soundness of arguments. May include syllogistic, elementary symbolic, inductive logic, scientific method. *[Satisfies General Studies Requirements: HU, L1]*

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. *[Satisfies General Studies Requirements: HU, H]*

301 History of Ancient Philosophy. (3) F
History of western philosophy from its beginnings through the Hellenistic period. *[Satisfies General Studies Requirements: HU, H]*

302 History of Modern Philosophy. (3) S
History of western philosophy from the Renaissance through Kant. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

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 instructor approval. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

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, aesthetic perception and experience, objectivity and relativity in art criticism. *[Satisfies General Studies Requirement: HU]*

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 instructor approval. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

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. Prerequisite: one course from among PHI 101, 103, 111, 301, 333 or 350. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirement: HU]*

319, 320 Introduction to Asian Philosophies I, II. (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) N
Philosophical problems surrounding the aims, structure and methods of theories in the social sciences. *[Satisfies General Studies Requirements: HU, SB]*

332 19th Century Philosophy. (3) N
The history of 19th Century philosophical thought emphasizing either the German or the British traditions. Prerequisite: PHI 302. *[Satisfies General Studies Requirements: HU, H]*

333 Introduction to Symbolic Logic. (3) A
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.

350 Philosophical Argument and Exposition. (3) F, S
The development of techniques of philosophical argument and exposition. Frequent written exercises. Course content may vary with instructor. Prerequisites: major; instructor approval.

401 Rationalism. (3) N
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. *[Satisfies General Studies Requirements: HU, H]*

402 Empiricism. (3) N
Examination of representative(s) of either classical or contemporary philosophical empiricism: e.g., Bacon, Hobbes, Locke, Butler, Berkeley, Reid, Hume, Mill, Carnap, Ayer. Prerequisites: PHI 302; plus one of the following: PHI 305, 309, 312, 316, 317. *[Satisfies General Studies Requirements: HU, H]*

413 Advanced Symbolic Logic. (3) N
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
Course descriptions and prerequisites on file in department. Courses may be repeated for credit. Topics may be selected from the following:
(a) Metaphysics/Epistemology
(b) Philosophy of Language/ Logic
(c) Value Theory
(d) History of Philosophy
(e) Philosophy of Science

591 Seminar. (1-3) A
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, 494, 497, 498, 499, 590, 591, 592, 598, 599. (See pages 36-37.)

HISTORY AND PHILOSOPHY OF SCIENCE

HPS 201 Technology and Social Change. (2) A
Technology as related to social change; contemporary impact of technology on society. Cross-listed as STE 201. *[Satisfies General Studies Requirement: HU]*

321 Man and Machine. (2) A
Relation of man to machine examined in historical, political and social terms. Comparisons with a look at artificial intelligence studies. Cross listed as STE 310. *[Satisfies General Studies Requirements: HU, H]*

322, 323 Science and Technology in History. (3) F, S
Development and application of scientific thinking from ancient times to present. First semester through 17th century. Second semester: 18th to present. Cross listed as STE 311, 312. *[Satisfies General Studies Requirements: HU, H]*

330 History of Biology. (3) N
Focuses on the 19th and 20th centuries, considering biology as a discipline, evolution and problems of heredity, development and cell theory. Cross-listed as ZOL 316.

331 History of Medicine. (3) N
Scientific study of the body, changing theories of disease, evolution of practical opinions about treatment and the emerging institutionalization of medical practice. Students may receive credit for this course and BIO 218. Cross-listed as ZOL 318.

402 Technology, Society and Human Values. (3) A
Values which motivate mankind to create technology. Areas of conflict and resolution of conflict between values and technology. Readings and discussions with visiting lecturers. Cross-listed as STE 402. Prerequisite: junior standing or above. *[Satisfies General Studies Requirement: HU]*

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. Cross-listed as STE 411.

Special Courses: HPS 394, 492, 493, 494, 497, 499. (See pages 36-37.)

Physics

PROFESSORS:
JACOB (PS F-470), COMFORT, A. COWLEY, J. COWLEY, HANSON, HESTENES, KAUFMANN, KYRALA, LU, NIGAM, PAGE, ROY, SMITH, SPENCE, STARRFIELD, STEARNS, STROJNIK, TILLERY, TSONG, VENABLES, VOSS, WYCKOFF

ASSOCIATE PROFESSORS:
AANNESTAD, ACHARYA, BENIN, LINDSAY, MARZKE, SANKEY

ASSISTANT PROFESSORS:
BENNETT, BURSTEIN, CHAMBERLIN, MENENDEZ, NORTHRUP, REZ, RITCHIE, TSEN, WINDHORST

PROFESSORS EMERITI:
KEVANE, MEISTER, RAWLS, SNYDER, YALE

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. Required courses are PHY 121, 122, 131, 132, 241, 242, 321, 322, 331, 332, 333, 334, 362, 441, 465, 471. Additional courses in physics and other related fields will be selected with the approval of the advisor. Supporting mathematics courses MAT 270, 271, 272, 274, and either MAT 242 or 342 are required in addition to the 45 semester hour major requirement. MAT 290, 291 may be

substituted for MAT 270, 271, 272. French, German, or Russian is strongly recommended to fulfill foreign language requirement.

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 PHY 121, 122, 131, 132, 241, 242, 321, 331, 332, 333, 334, 362, 441, 471. The remaining courses to a total of 53 hours required for this option 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 242 (or 342), 274, 290†, 291. MAT 270, 271, 272 may be substituted for MAT 290, 291. French, German, or Russian is strongly recommended to fulfill foreign language requirement.

Astronomy. The astronomy faculty offer courses in astronomy both for non-science majors and for science and physics majors. For an emphasis in astronomy, the following courses (or their equivalents) should be taken: AST 321, 322, 421, 422, 499.

Departmental Minor Requirements

Astronomy. Consists of a minimum of 24 semester hours. Required courses are AST 125, 126, 321, 322; PHY 121, 122, 131, 132, 241, 242. Electives to be chosen with approval of an astronomy advisor from upper-division courses in physics and astronomy.

Physics. Consists of a minimum of 24 semester hours. Required courses are PHY 121, 122, 131, 132, 241, 242, 321, 362. Electives are to be chosen with approval of the physics advisor from upper-division courses in physics and astronomy.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Physics. *Option No. 1.* Consists of 42 semester hours. Required courses are PHY 121, 122, 131, 132, 241, 242 (or 111, 112, 113, 114 on approval of advisor), 321; 331, 333; 362, 363, and two or more hours in 484. Electives to be chosen in physics and/or other closely related fields, subject to approval of advisor.

Physics. *Option No. 2.* An interdisciplinary 60-hour program which consists 30 semester hours in physics and an additional 30 semester hours in either chemistry (see page 96) or mathematics (see page 136). The physics portion of this program requires the following courses: PHY 121, 122, 131, 132, 241, 242 (or 111, 112, 113, 114 on approval of advisor), 321, 331, 333, 361 (or 362) and 363; two or more hours in 484. Electives to complete the 30-hour physics portion are to be chosen from physics and/or closely related fields, subject to the approval of the physics advisor.

General Science. Consists of 42 semester hours. Required courses are: BIO 181, 182; CHM 113, 116; GLG 101, 102, 103; PHY 111, 112, 113, 114. Electives to be chosen, with advisor approval, from among courses in astronomy, chemistry, geology, physics, biology, botany, meteorology and zoology.

Departmental Minor Teaching Field Requirements

Physics. Consists of 24 semester hours. Required courses are PHY 121, 122, 131, 132, 241, 242 (or 111, 112, 113, 114 on approval of advisor), 361 (or 362) and 363; two hours in 484. The remaining hours are to be selected from upper-division courses in physics and/or astronomy (including AST 125, 126) subject to approval of the 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 Catalog* for requirements.

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. 3 lectures, 1 recitation, 2 hours lab. *[Satisfies General Studies Requirements: S1, S2]*

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. 3 lectures, 1 recitation, 2 hours lab. Prerequisites: algebra and trigonometry. *[Satisfies General Studies Requirements: S1, S2]*

111, 112 General Physics. (3) F, S, SS
Noncalculus treatment of the principles of physics for non-physics majors. Students whose curricula require a laboratory course must also register for PHY 113†, 114†. 3 lectures, 1 recitation. Prerequisite: trigonometry. *[Satisfies General Studies Requirements: S1, S2]*

113, 114 General Physics Laboratory. (1) F, S, SS
Elementary experiments in physics. May be taken concurrently with, or subsequent to PHY 111†, 112†, respectively. 2 hours lab. Outside preparation for experiments and report writing are required. *[Satisfies General Studies Requirements: S1, S2]*

116 University Physics. (4) F
Principles of physics using calculus. 4 lectures, 1 recitation. For physics laboratory at this level, enroll in PHY 118†. Prerequisite: PHY 115†. Corequisite: MAT 291† or equivalent. *[Satisfies General Studies Requirements: S1, S2]*

118 University Physics Laboratory. (1) F
Introductory experiments, measurements and techniques in physics. 2 hours lab. Outside preparation for experiments and report writing are required. Pre- or corequisite: PHY 116†. *[Satisfies General Studies Requirements: S1, S2]*

121 University Physics I: Mechanics. (3) F, S, SS
Kinematics, Newton's laws, work, energy, momentum, conservation laws, dynamics of particles, solids and fluids. 3 lectures, 1 recitation. Corequisite: MAT 270 or 290. Concurrent enrollment in laboratory (PHY 122) is recommended. *[Satisfies General Studies Requirements: S1, S2]*

122 University Physics Laboratory I. (1) F, S, SS
Laboratory accompanying PHY 121. Pre- or corequisite: PHY 121. *[Satisfies General Studies Requirements: S1, S2]*

131 University Physics II: Electricity and Magnetism. (3) S, SS
Electric charge and current, electric and magnetic fields in vacuum and in materials, induction. AC circuits, displacement current, electromagnetic waves. 3 lectures, 1 recitation. Prerequisite: PHY 121. Corequisite: MAT 271 or 291. Concurrent enrollment in laboratory (PHY 132) is recommended. *[Satisfies General Studies Requirements: S1, S2]*

132 University Physics Laboratory II. (1) S, SS
Laboratory accompanying PHY 131. Pre- or corequisite: PHY 131. *[Satisfies General Studies Requirements: S1, S2]*

241 University Physics III: Thermodynamics, Optics and Wave Phenomena. (3) N
Heat, entropy and the laws of thermodynamics; wave propagation; geometrical and physical optics; introduction to special relativity. 3 lectures, 1 recitation. Prerequisite: PHY 131. Concurrent enrollment in laboratory (PHY 242) is recommended. *[Satisfies General Studies Requirements: S1, S2*

242 University Physics Laboratory III. (1) N
Laboratory accompanying PHY 241. Pre- or corequisite: PHY 241. *[Satisfies General Studies Requirements: S1, S2]*

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: MAT 274, 291†; PHY 116† or 131; or equivalent. Corequisite: 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. (3) F
Statis and quasistatic electric and magnetic fields, electric current, electromagnetic induction, fields in matter, introduction to Maxwell's equations. Prerequisites: MAT 242, 274. Corequisite: PHY 321 or 401.

332 Electromagnetic Fields. (3) S
Maxwell's equations and applications, radiation and propagation of electromagnetic waves. Prerequisite: PHY 331.

333 Intermediate Physics Laboratory I. (3) F, S
Basic physical measurements techniques with emphasis on modern electrical and electronic instrumentation. 1 hour lecture, 3 hours lab. Equivalent effort outside of the laboratory is required. Prerequisites: MAT 274 or equivalent; PHY 117†, 118† (or 122, 132, 242), 321†; or instructor approval.

334 Intermediate Physics Laboratory II. (2) F, S
Experiments selected in consultation with instructors to suit the student's need and interests. 3 hours lab. Equivalent effort outside of the laboratory is required. Prerequisites: PHY 331†, 333†.

351 Optics. (3) F
Matrix methods in geometrical optics; interferometry, partial coherence, selective absorbers; Fresnel and Fraunhofer diffraction; Fourier transform spectroscopy. Prerequisites: MAT 272† or 291†; PHY 116† or 241.

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† or 241.

362, 363 Modern Physics. (3) F, S
Special relativity, foundations and theoretical concepts of quantum theory; introduction to atomic, molecular, solid state and subatomic physics. Prerequisites: PHY 116† or 242. Corequisite: 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†, 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.

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 363†.

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. 3 hours lab. May be repeated for a maximum of 3 hours credit. Prerequisite: PHY 112†.

465 Advanced Physics Laboratory I. (2) F, S
Continuation of PHY 334† at a more advanced level. 3 hours lab. Equivalent effort outside of the laboratory is required. Prerequisite: PHY 334†. Corequisite: PHY 362† or instructor approval.

466 Advanced Physics Laboratory II. (1-3) F, S
Continuation of PHY 465. May be repeated for credit. Prerequisites: PHY 465†.

471 Quantum Mechanics. (3) F
Wave mechanics, Schrodinger's equation, barrier problems, operators and eigenfunctions, harmonic oscillator, one-electron atoms. Prerequisites: MAT 242†, 274†; PHY 363†; or instructor approval.

472 Quantum Mechanics. (3) S
Matrix mechanics, angular momentum, perturbation theory, scattering theory. Prerequisite: PHY 471† or instructor approval.

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: instructor approval.

481 Solid State Physics. (3) S
Structure, elastic properties and dynamics of crystals; electron motions in crystals under applied fields. Prerequisite: PHY 363†.

484 Internship: Physics Teaching. (1-4) F, S, SS
Preparation for high school physics teaching. Student will work closely with a faculty member in the elementary physics program. May be repeated for a total of 6 semester hours. Prerequisite: instructor approval.

495 Project Research. (1-3) F, S
Supervised project in experimental physics. May be repeated for credit. Prerequisite: 4 hours selected from PHY 333†, 334† and 465†. 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) 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 instructor approval.

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: instructor approval.

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. Prerequisites: PHY 322†, 521†.

523 Relativity. (3) N
Special and general theories of relativity. Prerequisites: PHY 522†, 532†; or instructor approval.

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 instructor approval.

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 instructor approval.

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†. PHY 442† recommended.

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 instructor approval.

561, 562 Nuclear Physics. (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 instructor approval.

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) 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; angular momentum and group representation theory; collision processes; relativistic quantum theory. Prerequisites: PHY 471†, 521†.

578, 579 Relativistic Quantum Theory. (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. Pre- or corequisites: PHY 472†, 481†, 576†.

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†.

587, 588 Quantum Optics. (3) F, S
Quantization of the electromagnetic field. Quantum theory of coherence, photon counting, photon states, lasers, density operators, atomic Raman scattering. Prerequisite: PHY 471.

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.

Special Courses: PHY 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 36-37.)

ASTRONOMY

AST 111 Introduction to Astronomy, I. (3) F, SS
For non-science majors. History; properties of light; instruments; study of solar system and nearby stars. Optional laboratory: AST 125. *[Satisfies General Studies Requirements: S1, S2]*

112 Introduction to Astronomy, II. (3) S, SS
For non-science majors. Structure and evolution of stars; star clusters; galaxies; cosmology. Optional laboratory: AST 126. *[Satisfies General Studies Requirements: S1, S2]*

125 Astronomy Laboratory, I. (1) F
Astronomical observations and experiments designed to help the student become familiar with the sky, telescopes and astronomical measurements. 2½ hours lab. Pre- or corequisites: AST 111 or 321; a working knowledge of high school algebra and geometry. *[Satisfies General Studies Requirements: S1, S2]*

126 Astronomy Laboratory, II. (1) S
Similar to AST 125, but material chosen to supplement AST 112 and 322. 2½ hours lab. Pre- or corequisites: AST 112 or 322; a working knowledge of high school algebra and geometry. *[Satisfies General Studies Requirements: S1,S2]*

301 Discovering the Sun and its Planets. (3) F
Comprehensive first course in astronomy for non-science majors. Course will include lectures plus written assignments and laboratory work. Not open to students with credit in AST 111 or equivalent. Prerequisites: algebra and geometry; or instructor approval.

302 Modern Astronomy. (3) S
Second course in astronomy for non-science majors. Covers achievements and controversies of 20th-century astronomy through lectures, written assignments and laboratory work. Not open to students with credit in AST 112 or equivalent. Prerequisite: AST 301 or instructor approval.

321 Solar System Astronomy. (3) F, SS
For science majors. Physical laws; evolution of the sun and planets; extraterrestrial life; astronomical instrumentation. Optional laboratory: AST 125. Pre- or corequisites: MAT 210 or equivalent. *[Satisfies General Studies Requirements: S1, S2]*

322 Stars, Galaxies and the Universe. (3) S, SS
For science majors. Star formation, structure, evolution; interstellar medium; star clusters, galaxies; distance scale; cosmology. Optional laboratory: AST 126. Prerequisite: AST 321 or instructor approval. Pre- or corequisites: MAT 210 or equivalent. *[Satisfies General Studies Requirements: S1, S2]*

421 Astrophysics I. (3) F
Aspects of observational astronomy; atomic properties of matter; stellar atmospheres; stellar structure, evolution; nucleosynthesis; compact objects; close binary systems. Prerequisites: AST 321, 322 or equivalent; PHY 321, 331, 362; or instructor approval.

422 Astrophysics II. (3) S
Interstellar medium; gaseous nebulae; shock waves; stellar dynamics; star clusters and stellar populations; galaxies and their evolution; cosmology. Prerequisites: AST 321, 322 or equivalent; PHY 321, 332, 363; or instructor approval.

Special Courses: 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 36-37.)

PHYSICAL SCIENCES

PHS 110 Fundamentals of Physical Science. (4) F, S
One-semester survey of the principles of physics and chemistry. Understanding of elementary algebra is presumed. 3 lectures, 2 hours lab. *[Satisfies General Studies Requirements: S1, S2]*

361, 362 Science and Society. (2) F, S
Fundamental principles of physical science as a creative human enterprise and its relationship to technology and the environment.

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.

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: PHS 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 36-37.)

Political Science

PROFESSORS:
JONES (SS 410), ALISKY, BERMAN, CHAUDHURI, HINK, JO, KAMINSKY, KIRKPATRICK, MASON, McGOWAN, MILLER, RICE, SIMON, WALKER

ASSOCIATE PROFESSORS:
ASHLEY, DAGGER, DALGLEISH, DANTICO, HERO, McGAW, OLSON, READER, STOOKEY, WATSON, WOLF, YOUNGBLOOD

ASSISTANT PROFESSORS:
BURT-WAY (ASU WEST CAMPUS), GEER, KEATING, KENNEY, NICHOLLS

PROFESSORS EMERITI:
HOLMES, PEEK, SCHWADA, SWAGERT, WHITE

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

Political Science. Consists of 45 semester hours 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 310), 150 (or 160), 301; and one from among 440, 441, 442, 443, 445 or 446.

Students who major in Political Science must have a 2.00 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 81.)

Latin American Studies Combined Degree Program. (See Latin American studies, page 86.) Consists of the B.A. 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 B.A. degree with a major in Political Science–Latin American Studies emphasis.

Asian Studies Emphasis. (See Asian studies, page 85.) Consists of the B.A. 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 B.A. with a major in Political Science–Asian Studies emphasis.

Bachelor of Science Degree Curriculum

Political Science. Consists of 36 semester hours in political science; 15 in closely related fields. At least 21 hours in political science must be in upper-division courses. Required courses in political science are POS 110 (or 310), 150 (or 160), 301, 401; and one from among 440, 441, 442, 443, 445 or 446. Of the 15 hours in closely related fields, 6 hours must be taken, in any combination, from among the following courses: CSC 100, 181, 183, 304, 305; MAT 115, 117, 119, 210, 242, 243, 270, 290; PHI 103, 314, 325, 333, 413. The remaining 9 hours in closely related fields are to be approved by the advisor in consultation with the student.

Students who major in Political Science must have a 2.00 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 81.)

Departmental Minor Requirements

Political Science. Consists of 18 semester hours in political science courses, 12 hours of which must be in upper-division courses. Required courses are POS 110 (or 310) and 150 (or 160). No more than 3 hours of Internship (POS 484) and 3 hours of Independent Study (POS 499) may be applied to the minor.

Students who minor in Political Science must have a 2.00 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" in a lower-division course may be counted toward the minor.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Political Science. Consists of 45 semester hours, 30 of which must be in political science and 15 in closely related fields. Six courses are required: POS 110 (or 310), 150 (or 160), 301, 417, 480; one from among 440, 441, 442, 443, 445 or 446.

Students who major in Political Science must have a 2.00 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 in political science courses. Six courses are required: POS 110 (or 310), 150 (or 160), 301, 417, 480; one from among 440, 441, 442, 443, 445 or 446.

Students who minor in Political Science must have a 2.00 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 minor.

Departmental Graduate Programs

The Department of Political Science offers programs leading to the M.A. and Ph.D. degrees. Consult the *Graduate 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. *[Satisfies General Studies Requirements: SB, H]*

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 re-

quirement for teacher certification. Not open to students with credit for 310. *[Satisfies General Studies Requirement: SB]*

120 Political Issues and Public Policy. (3) A
Contemporary social problems and political issues, particularly development of public policy. *[Satisfies General Studies Requirement: SB]*

150 Comparative Government. (3) F, S
Political institutions and processes in selected foreign countries: origins, strengths and weaknesses of contemporary political systems, political development. *[Satisfies General Studies Requirements: SB, G]*

160 Global Politics. (3) F, S
The nature of contemporary world politics through the study of both general theoretical topics and specific geographical areas. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirement: SB]*

294 Special Topics: Introduction to Southeast Asia (3) N
[Satisfies General Studies Requirement: G]

301 Empirical Political Inquiry. (3) F, S
Logic of political inquiry including research problems, concepts, hypotheses, theories, measurement, data collection and analysis. *[Satisfies General Studies Requirement: SB]*

310 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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

313 The Congress. (3) A
Lawmaking process in the U.S. Congress. *[Satisfies General Studies Requirement: SB]*

314 The American Presidency. (3) A
Office, role and power of the American presidency in the American political system. *[Satisfies General Studies Requirement: SB]*

315 The Supreme Court. (3) A
Role of the Supreme Court in American society and politics; examination of decision-making process, impact of decisions; restraint versus activism. *[Satisfies General Studies Requirement: SB]*

316 State and Local Government. (3) A
Survey of the operations, problems and policies of state and local governments in the U.S. *[Satisfies General Studies Requirement: SB]*

320 Public Administration. (3) A
Role of the administrator in the political process with an examination of the basic concepts of bureaucracy. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

330 Current Issues in National Politics. (3) F, S
Major issues facing national governments in the domestic field. *[Satisfies General Studies Requirement: SB]*

331 Public Opinion. (3) A
Formation, expression and influence of individual and organized opinion on political institutions. *[Satisfies General Studies Requirement: SB]*

332 American Political Parties. (3) A
Development of the American party system. Party organization and functions. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

336 Electoral Behavior. (3) A
Voting behavior and the attitudes, perceptions and activities of the citizenry in the political process. *[Satisfies General Studies Requirement: SB]*

350 Comparative Politics. (3) A
Theoretical approaches and political institutions, such as parties, pressure groups, legislatures and executives, from a cross-national perspective. *[Satisfies General Studies Requirements: SB, G]*

351 The British Nations. (3) A
Examines such parliamentary systems as Great Britain, Ireland, Canada, Australia and New Zealand. *[Satisfies General Studies Requirements: SB, G]*

352 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. *[Satisfies General Studies Requirement: SB]*

356 Western Europe. (3) A
Structures and behavior of governmental institutions and political processes in selected countries of Western Europe. *[Satisfies General Studies Requirements: SB, G]*

360 Current Issues in International Politics. (3) F, S
An analysis of major current problems in world politics. *[Satisfies General Studies Requirements: SB, G]*

361 American Foreign Policy. (3) A
United States in world affairs; foreign policy since World War I. Techniques in formulating American foreign policies. *[Satisfies General Studies Requirement:s: SB, G]*

401 Political Statistics. (3) F, S
Basic concepts in statistics as they facilitate the description, explanation and prediction of social and political phenomena. *[Satisfies General Studies Requirement: N2]*

410 Urban Government and Politics. (3) A
Governmental organizations, decision-making structures and problems of urban political systems. *[Satisfies General Studies Requirement: SB]*

417 The Arizona Political System. (3) N
Contemporary political problems within the context of Arizona's political, social and constitutional frameworks. Meets the Arizona Constitution requirement for certification. *[Satisfies General Studies Requirement: SB]*

422 Politics of Bureaucracy. (3) N
Bureaucracy as a political entity; internal dynamics of public agencies; the relationship between public agencies and other political entities. *[Satisfies General Studies Requirement: SB]*

423 Politics of Budgeting. (3) N
The policy process in budgeting; strategies used to influence this process and recent reforms in public budgeting. *[Satisfies General Studies Requirement: SB]*

424 Regulatory Politics. (3) N
Development and implementation of governmental policies regulating business activity, e.g., anti-trust, consumer and environmental protection and labor relations. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

435 Women, Power and Politics. (3) N
The roles and treatment of women within various political contexts. Specific focus may vary with instructor. *[Satisfies General Studies Requirement: SB]*

439 Minority Group Politics in America. (3) N
Role of minority groups in American politics. *[Satisfies General Studies Requirement: SB]*

440 History of Political Philosophy I. (3) A
Western political philosophers and their theories to the 17th century. *[Satisfies General Studies Requirements: HU, H]*

441 History of Political Philosophy II. (3) A
Western political philosophers and their theories from the 17th to the 20th century. *[Satisfies General Studies Requirements: HU, H]*

442 American Political Thought. (3) A
Political theories and movements from the colonial period to the present. *[Satisfies General Studies Requirements: HU, H]*

443 Topics in Contemporary Political Theory. (3) A
Major problems and theories in contemporary political thought. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

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. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirements: SB, G]*

451 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. *[Satisfies General Studies Requirements: SB, G]*

452 China. (3) A
Background of the Communist revolution, political processes and developmental problems in China from a comparative perspective. *[Satisfies General Studies Requirements: SB, G]*

453 South America. (3) A
Governmental institutions, political processes and developmental problems of the South American states. *[Satisfies General Studies Requirements: SB, G]*

454 Mexico. (3) A
Mexican federal, state and local governmental institutions. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirements: SB, G]*

456 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. *[Satisfies General Studies Requirement: SB]*

458 Southeast Asia. (3) A
Political background, governmental institutions, political dynamics and developmental problems of Southeast Asian nations. *[Satisfies General Studies Requirements: SB, G]*

459 Sub-Saharan Africa. (3) N
Governmental institutions and processes of politics south of the Sahara. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirements: SB, G]*

462 Soviet Foreign and Defense Policies. (3) A
Examination and analysis of foreign and defense policies of the Soviet Union. *[Satisfies General Studies Requirements: SB, G]*

463 Inter-American Relations. (3) A
Diplomatic relations among the Latin American states. Development of U.S. foreign policy toward Latin America. *[Satisfies General Studies Requirements: SB, G]*

464 American Defense Policy. (3) A
Problems and issues of the organization and control of the defense establishment of the U.S. *[Satisfies General Studies Requirement: SB]*

465 International Organization and Law. (3) A
History, practical political significance and future of international institutions, transnational regimes and international law. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirements: SB, G]*

468 Comparative Asian Foreign Policies. (3) A
Foreign policies of the Asian states emphasizing their security relations and movements toward regionalism. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

480 Methods of Teaching Government. (3) N
Methods of instruction, organization and presentation of subject matter in political science. Prerequisite: 15 hours in political science or instructor approval. Pre- or corequisite: SED 311†.

484 Internship. (1-6) A; except Legislative Internships (12) S
[Satisfies General Studies Requirement: SB]

485 Political Economy. (3) A
Problems, policies and possibilities of various political-economic systems and the interrelationship of capitalism, socialism and democracy. *[Satisfies General Studies Requirement: SB]*

486 International Political Economy. (3) A
Contending approaches to historical and contemporary issues of international political economy, including global welfare, equality, ecology and peace. *[Satisfies General Studies Requirements: SB, G, H]*

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 instructor approval. *[Satisfies General Studies Requirement: L2]*

501 Methods of Political Science. (3) F
Introduces research methods and techniques of the discipline, with attention to the empirical foundations and analytic methods employed in each of several subfields.

502 Philosophy of Political Inquiry. (3) A
Problems of knowledge and method in political science, with attention to both empirical and evaluative analysis.

503 Empirical Political Inquiry. (3) F
Basic research methods and techniques with statistical and computer applications. Prerequisite: POS 401 or equivalent; instructor approval.

591 Seminar. (3) A
(a) American Politics (c) Public Policy
(b) Global Politics (d) Political Theory

598 Special Topics. (3) A
(a) American Politics (c) Public Policy
(b) Global Politics (d) Political Theory

601 Advanced Experimental Research. (3) N
The implementation of experimental and quasi-experimental research designs as models of inquiry as applied in political research, including laboratory techniques and topics in the analysis of variance. Prerequisite: POS 503 or equivalent.

602 Advanced Survey Research. (3) N
Problems in the design and conduct of political surveys, including sampling, instrument design, scaling and statistical and graphical analysis of survey data. Prerequisite: POS 503 or equivalent.

603 Polimetrics I. (3) S
Applications of the general linear model to topics in the estimation of single equation models of political phenomena. Prerequisite: POS 503 or equivalent.

604 Polimetrics II. (3) F
Continuation of POS 603, including techniques of simultaneous equation estimation and other multi-variate statistical techniques such as time-series, factor and discriminant analysis. Prerequisite: POS 603.

792 Research. (3) F, S
Projects in various areas of political science. Prerequisite: doctoral student.

Special Courses: POS 294, 394, 492, 493, 494, 498, 499, 590, 591, 592, 593, 594, 598, 599, 691, 692, 693, 790, 792, 799. (See pages 36-37.)

Psychology

PROFESSORS:
PARKINSON (PSY B-237C), AIKEN, BERNAL, BRAUN, CIALDINI, EISENBERG, HAYGOOD, HOMA, JONES, KAROLY, KILLEEN, LANYON, LINDER, MEYERSON, REICH, RUSSO, SANDLER, SOMERVILLE, VESTRE, WEST

ASSOCIATE PROFESSORS:
BARRERA, BRAVER, CHARTIER, CHASSIN, FEHR, GLANZMAN, KENRICK, LESHOWITZ, LEVINE, LINDHOLM, PRESSON, ROSSI, SADALLA, WOLCHIK, ZAUTRA

ASSISTANT PROFESSORS:
STONE, VANORDEN

INSTRUCTOR:
RITCHIE

PROFESSORS EMERITI:
BARDRICK, GURNEE

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 *28* semester hours in psychology, including at least 15 upper-division hours. Required courses, which must be passed with a minimum grade of "C," are PGS 100, 315 (or 341 or 350); PSY 230, 290, 323 (or 324 or 325); one additional upper-division PSY course; two additional upper-division courses (PGS or PSY); and one additional psychology course. No more than a total of 3 hours in PGS 399, 499 and PSY 499 combined may be used to complete the 15 hours of upper-division requirements. *Eighteen hours* in courses related to psychology are required. They are to be approved by an undergraduate advisor and include one course from among CSC 100, 181 and 183. College graduation requirements are on page 82.

Bachelor of Science Degree Curriculum

Psychology. Consists of *31* semester hours in psychology, including at least 15 hours in upper-

division courses. Required courses, which must be passed with a minimum grade of "C," are PGS 100, 315 (or 341 or 350); PSY 230, 290, 323 (or 324 or 325); one additional upper-division PSY course; two additional upper-division courses (PGS or PSY); and two additional psychology courses. No more than a total of 3 hours in PGS 399, 499 and PSY 499 combined may be used to complete the 15 hours of upper-division requirements. *Eighteen hours* in courses related to psychology are required. They are to be approved by an undergraduate advisor and include one course from among CSC 100, 181, 183. College graduation requirements on page 82.

Departmental Minor Teaching Field Requirements

(Secondary Education)

Consists of 24 semester hours. See advisor.

Departmental Graduate Programs

The Department of Psychology offers programs leading to the Ph.D. degree. Consult the *Graduate Catalog* for requirements.

PSYCHOLOGY (PGS)

Courses which may be applied toward college graduation 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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

304 Effective Thinking. (3) A
Understanding and improving intellectual skills. Intelligence, problem solving, decision making, logic and inference. Lecture and lab. Prerequisite: MAT 119, PSY 230 or equivalent.

306 Environmental Psychology. (3) F, S, SS
Concepts and research strategies in the study of behavior in interaction with physical environment. Prerequisite: PGS 100. *[Satisfies General Studies Requirement: SB]*

315 Personality Theory and Research. (3) F, S, SS
Definition and description of personality in terms of theoretical and methodological approaches. Prerequisite: PGS 100. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

341 Developmental Psychology. (3) F, S
Behavior development analyzed in terms of psychological principles. Current research in human development. Prerequisite: PGS 100. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: SB]*

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†. *[Satisfies General Studies Requirement: SB]*

399 Supervised Research. (1-3) F, S, SS
Experience within the context of current faculty research projects. Student is assigned responsibility depending on qualifications. "Y" grade only. May be repeated for a total of 6 hours. Prerequisites: approval of faculty member prior to registration; "B" average in major. Pre- or corequisite: PSY 230† or equivalent.

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 instructor approval. *[Satisfies General Studies Requirement: SB]*

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: MGT 301 or PGS 100.

441 Cognitive Development. (3) F, S
Experimental and theoretical literature in child development and behavior. Prerequisite: PGS 341† or instructor approval. *[Satisfies General Studies Requirement: SB]*

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†. *[Satisfies General Studies Requirement: SB]*

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 instructor approval. *[Satisfies General Studies Requirement: SB]*

444 Directed Child Study. (1-3) F, S, SS
Supervised experience with children in the pre-school program of the Child Study Laboratory. May be repeated for a total of 9 credits. Prerequisites: CDE 232† or PGS 341†; instructor approval.

445 Child Language and Drawing. (3) F
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. *[Satisfies General Studies Requirement: SB]*

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†. *[Satisfies General Studies Requirement: SB]*

461 Interpersonal Influence. (3) N
Principles and procedures that affect the process of social influence, consideration of attitudinal, compliance inducing and perceptual influences. Prerequisite: PGS 350. *[Satisfies General Studies Requirement: SB]*

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, 315†. *[Satisfies General Studies Requirement: SB]*

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: MGT 311 or PGS 430; PGS 100; one course in statistics.

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 294, 394, 494, 498, 499. (See pages 36-37.)

PSYCHOLOGY (PSY)

Courses which may be applied toward Part B of the college graduation requirement in natural sciences and mathematics.

PSY 230 Introduction to Statistics. (3) F, S, SS
Basic concepts in descriptive and inferential statistics, emphasizing applications to psychology. The course has both self-paced (PSI) and lecture sections. Prerequisites: MAT 117†; PGS 100. *[Satisfies General Studies Requirement: N2]*

290 Experimental Psychology. (4) F, S
Planning, execution, analysis and reporting of experiments. Literature, procedures and instruments in representative areas of psychological research. 3 lectures, 3 hours lab. Prerequisite: PSY 230† or equivalent. *[Satisfies General Studies Requirements: L1, S2]*

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 instructor approval.

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 instructor approval.

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; instructor approval.

330 Statistical Methods. (3) S
Advanced application of statistics to psychology. Highly recommended for students interested in attending graduate school. 3 lectures, 1 hour lab. Prerequisite: PSY 230†. *[Satisfies General Studies Requirement: N2]*

420 Analysis of Behavior. (3) N
Research, applications and philosophy of the analysis and control of human behavior. Prerequisite: PSY 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. 3 lectures, 3 hours lab. Prerequisite: PSY 325† or equivalent.

432 Human Performance. (3) S
Analysis of human behavior in complex human-machine systems, including tracking, vigilance, scanning and failure detection. Prerequisites: PSY 290†; upper-division standing; or instructor approval.

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†, 324† or instructor approval.

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†; upper division standing; or instructor approval.

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. Prerequisite: 1 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. Prerequisites: PSY 230†; instructor approval.

501 Supervised Teaching. (4) F
Experience in and examination of perspectives on teaching undergraduate psychology. Prerequisites: graduate standing in psychology; instructor approval.

506 Survey of Research in Environmental Psychology. (3) F
Major topics and paradigms in the study of man-environment relationships. Prerequisite: instructor approval.

512 Advanced Learning. (3) N
Principles and theories of learning, emphasizing research literature. Prerequisite: instructor approval.

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: instructor approval.

524 Advanced Physiological Psychology. (3) N
Contributions of physiological processes and brain function to fundamental behavioral processes. Prerequisite: instructor approval.

528 Sensation and Perception. (3) N
Principles of sensory and perceptual processes, emphasizing research literature. Prerequisite: instructor approval.

529 Correlation and Psychometric Theory. (3) S
Principles of correlational techniques, including regression and multiple correlation. Psychometric theory, including reliability and validity. Prerequisite: instructor approval.

530 Intermediate Statistics. (3) F
Continuation of PSY 529. Psychological statistics, emphasizing the analysis of variance and the design of experiments. Prerequisite: instructor approval.

534 Information Processing. (3) N
Processes by which sensory input is transformed, reduced, elaborated, stored, recovered and used. Prerequisite: instructor approval.

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. Prerequisite: instructor approval.

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 instructor approval.

542 Social Development. (3) N
Major issues in the area of social development are topics for review and critique. Theory, research and content are covered. Prerequisite: instructor approval.

543 Moral Development. (3) N
A variety of issues in moral development including positive and negative behaviors are considered. Theory and research are major foci. Prerequisite: instructor approval.

550, 551 Advanced Social Psychology. (3) F, S
Theory and research concerning interpersonal perception, decision-making, attitude formation and change, group processes, social motivation and interaction processes. Prerequisite: instructor approval.

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 instructor approval.

555 Experimental and Quasi-Experimental Designs for Research. (3) N
Review of research techniques. Laboratory and field research analyzed; applications to specific topics. Prerequisite: instructor approval.

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, 551; or instructor approval.

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 instructor approval.

564, 565 Somatopsychology. (3) N
Theory and research in the psychological aspects of chronic illness, physical disability and mental retardation. Prerequisite: instructor approval.

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: instructor approval.

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 instructor approval.

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 instructor approval.

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 instructor approval.

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 instructor approval.

576, 577 Clinical Practicum. (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) F, S
Supervised experience in conceptualizing, conducting and evaluating psychological interventions to promote well-being in community settings. Advanced theory and research as relevant. Prerequisites: PSY 582 and advanced standing in psychology Ph.D. program or instructor approval.

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 instructor approval.

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. Prerequisite: PSY 572†; or instructor approval.

584 Advanced Treatment Methods. (3) N
Advanced theory, research and techniques of psychological treatment methods. Prerequisites: PSY 576†, 577†; instructor approval.

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 instructor approval.

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 instructor approval.

591 Seminar. (3) F, S, SS
Special Courses: PSY 394, 492, 493, 494, 497, 498, 499, 580, 584, 590, 591, 592, 599, 700, 791, 792, 799. (See pages 36-37.)

Religious Studies

PROFESSOR:
WENTZ
ASSOCIATE PROFESSORS:
MARTIN (LL B-605), FELDHAUS, FOARD, GEREBOFF, MORRISON
ASSISTANT PROFESSORS:
CADY, WOODWARD

Departmental Major Requirements

Bachelor of Arts Degree Curriculum

The major in Religious Studies consists of 45 semester hours. 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 2.50 is required in the 30 hours of religious studies courses. (See foreign language requirement, page 81.)

Departmental Minor Requirements

The minor in Religious Studies consists of 18 semester hours, at least 12 of which must be upper division. Both REL 305 and 405 are required.

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 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. *[Satisfies General Studies Requirements: HU, G]*

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. *[Satisfies General Studies Requirements: L1, HU, H]*

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. *[Satisfies General Studies Requirements: HU, H]*

294 Special Topics. (3) A
(a) The Magic of Magic *[Satisfies General Studies Requirement: L1]*
(b) Introduction to Southeast Asia *[Satisfies General Studies Requirement: G]*

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. *[Satisfies General Studies Requirements: L2, HU, G]*

310 Western Religious Traditions. (3) A
Religious traditions of Judaism, Christianity and Islam, comparing their doctrinal, institutional and ritual systems and social histories. *[Satisfies General Studies Requirement: H]*

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. *[Satisfies General Studies Requirements: L2, HU, H]*

316 Types of Early Judaism. (3) A
Developments in Judaism during the inter-testamental period. *[Satisfies General Studies Requirements: HU, H]*

317 Introduction to Rabbinic Judaism (3) A
An historical analysis of the thought, literature and institutions of rabbinic Judaism. *[Satisfies General Studies Requirements: HU, H]*

320, 321 Religion in America. (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. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: L2, HU]*

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. *[Satisfies General Studies Requirements: L2, HU, H]*

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. *[Satisfies General Studies Requirements: L2, HU, H]*

350 Hinduism. (3) A
The study of diverse forms of Hinduism through its institutions, literature, folklore, art and architecture. *[Satisfies General Studies Requirements: L2, HU, G, H]*

351 Buddhism. (3) A
Doctrines, practices and institutions of the Buddhist religion, emphasizing its role in the history and culture of Asian societies. *[Satisfies General Studies Requirement: HU]*

365 Islamic Civilization. (3) A
An interdisciplinary survey of the art, history and religion of Islamic civilization. Cross-listed as HIS 365. *[Satisfies General Studies Requirements: HU, SB, G, H]*

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. *[Satisfies General Studies Requirement: HU]*

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. *[Satisfies General Studies Requirements: HU, H]*

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). *[Satisfies General Studies Requirements: HU, H]*

381 Religion and Moral Issues. (3) A
The manner in which human religiousness relates to social concerns; e.g., sexuality, the environment, bio-ethical issues and violence. *[Satisfies General Studies Requirements: L2, HU]*

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. *[Satisfies General Studies Requirements: L2, HU]*

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. *[Satisfies General Studies Requirements: L2, HU]*

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. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, H]*

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 or 321 recommended. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, H]*

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 or 321 recommended. *[Satisfies General Studies Requirements: HU, H]*

435 Problems in Native American Religions. (3) A
An in-depth consideration of selected problems in Native American religions. *[Satisfies General Studies Requirement: HU]*

443 Zen. (3) A
History, practices and cultural influence of Zen (Ch'an) Buddhism in China and Japan. *[Satisfies General Studies Requirements: HU, G]*

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. *[Satisfies General Studies Requirements: HU, G, H]*

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. *[Satisfies General Studies Requirements: L2, HU, H]*

460 Studies in Islamic Religion. (3) A
Issues in the interpretation and understanding of Islamic texts, history, society, culture and rituals. Prerequisite: REL 365; Religious Studies major; or instructor approval. *[Satisfies General Studies Requirements: HU, G]*

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. Prerequisite: REL 365; Religious Studies major; or instructor approval. *[Satisfies General Studies Requirements: HU, G]*

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). *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirement: HU]*

494 Special Topics in Religious Studies. (3) N
Open to all students, freshmen by instructor approval 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 instructor approval.

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, 599. (See pages 36-37.)

Sociology

PROFESSORS:
GORDON (SS 321), FARBER, HUDSON, MAYER, OWEN, PFUHL, SEBALD, WHITAM
ASSOCIATE PROFESSORS:
BENIN, COBAS, HARDERT, LANER, MILLER, NAGASAWA, SMITH, SNOW, SULLIVAN, THOMAS, WEITZ
ASSISTANT PROFESSORS:
CULLEN, KULIS, MUELLER (ASU WEST CAMPUS), VAUGHAN (ASU WEST CAMPUS),
PROFESSORS EMERITI:
AXELROD, GUILLOT, HENZE, HOULT, LINDSTROM

Departmental Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

Sociology. Departmental requirements are the same for the B.A. and for B.S. degrees; see the College of Liberal Arts and Sciences section of this *Catalog* for the additional requirements for these degrees. The departmental requirement for either degree consists of 45 semester hours 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 81.)

Departmental Minor Requirements

The department minor consists of 18 hours in sociology, including either SOC 101 (or 301); any one of SOC 391, 483, 485 or 486; four remaining courses to be chosen by the student in consultation with a sociology advisor.

Departmental Major Teaching Field Requirements

Bachelor of Arts in Education Degree Curriculum

Sociology. Consists of 63 semester hours of which 30 hours must be in sociology and are exactly those courses required for the B.A. or B.S. 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, 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 B.A. or B.S. in Sociology. The 30 hours must consist of SOC 101, 340†, 360, 390†, 391, 440, 446, 449, 483 (or 485 or 486); and SWU 291†. 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 M.A. and Ph.D. degrees. Consult the *Graduate 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. 2 hours lecture, 1 hour discussion. *[Satisfies General Studies Requirement: SB]*

294 Special Topics: Introduction to Southeast Asia (3) N
[Satisfies General Studies Requirement: G]

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. *[Satisfies General Studies Requirement: SB]*

305 Courtship and Marriage. (3) F, S, SS
An overview of courtship, marriage and related processes, focusing on problematical aspects of these institutions from the sociological perspective. *[Satisfies General Studies Requirements: SB, H]*

332 The Modern City. (3) F, S
Growth, characteristics and problems of the modern city. Prerequisite: SOC 101 or 301. *[Satisfies General Studies Requirement: SB]*

333 Population Problems. (3) F, S, SS
Theories of population change; births, deaths, migration; population policies. Prerequisite: SOC 101 or 301. *[Satisfies General Studies Requirements: SB, G]*

340 Sociology of Deviant Behavior. (3) F, S, SS
A sociological analysis of stigmatized behaviors and conditions, including the causes, effects and management of stigma. Prerequisite: SOC 101, 301 or instructor approval. *[Satisfies General Studies Requirement: SB]*

341 Modern Social Problems. (3) F, S, SS
Race relations, poverty, unemployment and other current issues. *[Satisfies General Studies Requirements: SB, H]*

348 Overview of Aging. (3) F
Multidisciplinary introduction to gerontology. Explores the characteristics, experiences, problems and needs of older persons. *[Satisfies General Studies Requirement: SB]*

351 Industrial Sociology. (3) S
Social and cultural analysis of industry. Occupational roles, status and social participation of workers. Prerequisite: SOC 101 or 301. *[Satisfies General Studies Requirement: SB]*

352 Social Change. (3) F, S
Patterns of social change, resistance to change and change-producing agencies and processes. Prerequisite: SOC 101 or 301. *[Satisfies General Studies Requirements: SB, G, H]*

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. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirements: SB, G]*

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. *[Satisfies General Studies Requirement: SB]*

365 The Sociology of Mass Communication. (3) F, S
A sociological exploration of the major mass media as a communicative process in American society. *[Satisfies General Studies Requirement: SB]*

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; passing a proficiency examination in basic algebra to be administered by the Department of Sociology; or instructor approval. Mat 106† recommended. *[Satisfies General Studies Requirement: N2]*

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 instructor approval. *[Satisfies General Studies Requirement: SB]*

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 instructor approval. *[Satisfies General Studies Requirement: SB]*

393 Practicum in Survey Research II. (3) S
Continuation of SOC 392. Provides practical experience in analysis and reporting survey data. Prerequisite: SOC 392†. *[Satisfies General Studies Requirement: SB]*

401 Comparative Sociology. (3) F
Cross-cultural study of basic social institutions; the methodology of cross-cultural research. Prerequisite: ASB 102 or SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirements: SB, G]*

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. Prerequisite: 6 hours in sociology including SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirements: L2, SB]*

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. Prerequisite: 6 hours in sociology including SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirement: SB]*

416 Marriage Problems in Contemporary Society. (3) S
Marital and family problems in today's society from the viewpoint of personal and cultural adjustment. Prerequisite: 6 hours in sociology including SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirement: SB]*

417 Family Violence. (3) F, S
A critical overview of current research and theory on several aspects of domestic violence including child maltreatment, spousal aggression and abuse of elders. Prerequisite: instructor approval. *[Satisfies General Studies Requirements: SB, H]*

432 Human Ecology. (3) F, S
Patterns and laws of societies' adjustments to the physical environment; distribution of communities and institutions. Prerequisite: 6 hours in sociology including SOC 101 or 301; college-level algebra; or instructor approval. *[Satisfies General Studies Requirement: SB]*

433 Demography. (3) S
Science of population analysis; problems in measurements of size, composition and changes in population. Prerequisite: 6 hours in sociology including SOC 101 or 301 and college level algebra; or instructor approval. *[Satisfies General Studies Requirements: N2, SB]*

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. Prerequisite: 6 hours in sociology including SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

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, 340†; or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

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, 301 or instructor approval. *[Satisfies General Studies Requirement: SB]*

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 instructor approval. *[Satisfies General Studies Requirement: SB]*

452 Sociology of Complex Organizations. (3) F
Sociological studies of government agencies, industrial firms, labor unions, military establishments and other large-scale organizations. Prerequisite: 6 hours in sociology including SOC 101, 301; or instructor approval. *[Satisfies General Studies Requirement: SB]*

453 Social Class and Stratification. (3) S
Social classes and the function of these groupings in a society. Prerequisite: 6 hours in sociology including SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirements: L2, SB]*

454 The Afro-American in Modern Society. (3) S
Social and cultural heritage of Black Americans; achievements and current trends. Prerequisite: instructor approval. *[Satisfies General Studies Requirement: L2, SB, H]*

455 Collective Behavior. (3) S
Social causes and consequences of such non-institutionalized forms of behavior as crowds, cults, publics, social movements and revolutions. Prerequisite: 6 hours in sociology including SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

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. *[Satisfies General Studies Requirements: SB, G, H]*

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 instructor approval. *[Satisfies General Studies Requirement: SB]*

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 instructor approval. *[Satisfies General Studies Requirements: SB, L2]*

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 instructor approval. *[Satisfies General Studies Requirements: SB, L2]*

483 History of Social Thought. (3) S, SS
Social thought in human culture. Background of modern sociology. Prerequisite: 6 hours in sociology including SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirements: SB, H]*

485 Sociology of Knowledge. (3) F
Relationship between social conditions and the development of knowledge in modern society. Prerequisite: SOC 101 or 301; or instructor approval. *[Satisfies General Studies Requirement: SB]*

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, 301 or instructor approval. *[Satisfies General Studies Requirement: SB]*

498 Pro-Seminar. (3) F, S
Topics to be selected. *[Alternate Futures Satisfies General Studies Requirements: SB, G]*

501, 502 Practicum in Survey Research. (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. Prerequisites: SOC 390† or equivalent; a proficiency examination. Enrollment in MAT 530 is encouraged.

507 Social Statistics III: Advanced Multivariate Analysis. (3) S
Topics include discriminant analysis, logistic regression and LISREL and log-linear models studied through the application of computers. Prerequisite: SOC 505 or instructor approval.

515 Studies of the Family. (3) S
Current developments in the study of marriage and the family. Prerequisite: instructor approval.

585 Development of Sociology. (3) F
Major sociological theorists, including Durkheim, Weber, Marx, Parsons, Merton, Dahrendorf, Homans, Mead. Prerequisite: instructor approval.

586 Contemporary Sociological Theory. (3) S
Analysis of major theories, including structural-functional, conflict, social exchange, symbolic interaction, role theory. Prerequisite: instructor approval.

587 Metasociology. (3) S
Nature of sociological assumptions. Nature and form of sociological theories. Context of discovery-grounded theory. Context of justification. Prerequisite: instructor approval.

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 instructor approval.

Special Courses: SOC 298, 484, 492, 493, 494, 497, 499, 500, 584, 590, 592, 594, 599, 700, 780, 791, 799. (See pages 36-37.)

Speech and Hearing Science

PROFESSORS:
LaPOINTE (LL A-129A), CLUFF, DORMAN, MOWRER, PRATHER
ASSOCIATE PROFESSORS:
CASE, CHUBRICH
LECTURER/CLINICAL SUPERVISORS:
HUEFFNER, KENNEY, MINTZ
CLINIC DIRECTOR:
WHALEY

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Speech and Hearing Science. The B.S. degree consists of a minimum of 45 semester hours emphasizing the developmental and scientific aspects of language, speech and hearing. The following courses, or their approved equivalents, are required: SHS 105, 294 ST: Phonetics, 310, 311, 367, 375, 376, 384 and 494 Introduction to Speech and Language Disorders. Supporting courses from related fields must include COM 100; ENG 213 (or ASB 480), 301; MAT 115; PGS 100; PSY 230; or their equivalents. The remaining speech and hearing science courses to complete the major will be determined by the student in consultation with an advisor. A list of approved electives is 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 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
Role of the parent, teacher and others in support of evaluation and treatment of communication disorders. Designed for non-majors. *[Satisfies General Studies Requirement: SB]*

310 Anatomical and Physiological Bases of Speech. (3) F
A non-cadaveric study of anatomical systems which underlie human speech and language: respiration, phonation, articulation and related nervous system processes. Pre- or corequisite: SHS 105.

311 Physical and Physiological Bases of Hearing. (3) S
Physical characteristics of sound and the structure and function of the human auditory system. Prerequisite: MAT 118.

367 Speech and Language Development. (3) F
Process of speech and language development from birth through adulthood. Prerequisite: ASB 381 or ENG 213.

375 Speech Science. (3) S
Normative aspects of speech, hearing and language. Prerequisites: SHS 310, 311.

376 Psychoacoustics. (3) F
Auditory processes underlying perception of sound. Subjective correlates of acoustic parameters, and perceptual responses to simple and complex auditory stimuli. Prerequisite: SHS 311.

384 Introduction to Hearing Disorders. (3) S
Survey of peripheral and central hearing disorders: characteristics, management and effects on communicators. Prerequisites: SHS 311, 376.

400 Methods of Audiometry. (4) F
Techniques and instrumentation used in measuring auditory threshold and audiogram interpretation. 3 hours lectures, 2 hours lab weekly. Prerequisites: SHS 311, 376, 384.

402 Modifying Communicative Behavior. (3) F
Principles and techniques of modifying speech and language behavior. Prerequisite: SHS 105.

430 Psychology of Hearing-Handicapped Children. (3) N
Effects of hearing impairment on child language acquisition, intellectual development, personality development and educational placement.

431 Nature of Fluency Disorders. (2) S
History and nature of fluency disorders. Prerequisite: instructor approval.

435 Hearing Conservation. (3) S
The causes and prevention of noise-induced hearing loss. Prerequisite: SHS 376.

450 Observation. (1) F, S
Supervised observation of evaluation and therapy representing the areas of language, speech and hearing. Prerequisite: instructor approval.

465 Language Acquisition. (3) F
Language development in the normal child. Prerequisite: instructor approval.

490 Childhood Language Disorders. (3) F
Introduction to the nature and treatment of language disorders in children. Prerequisites: SHS 310, 311, 367, 402.

494 Special Topics. (3) F, S
Topics may be selected from the following:
(a) Speech and language disorders
(b) Research
(c) Computer applications

495 Disorders of Articulation. (3) F
Detailed analysis of disorders of articulation. Prerequisites: ASB 383; SHS 105, 310, 402.

496 Aural Habilitation: Children. (3) S
Theories and practices in the education of hearing-handicapped children. Prerequisite: instructor approval.

502 Differentiation of Peripheral and Central Auditory Disorders. (3) F
Prerequisite: SHS 400.

504 Aural Rehabilitation: Hearing Aids. (3) F
Operation and application of amplifying devices relative to the aurally handicapped. Prerequisite: SHS 400.

508 Pediatric Audiology. (3) S
Audiologic testing and management of young children and infants. Prerequisites: SHS 400; instructor approval.

510 Advanced Hearing Science. (3) F
Psychoacoustic and psychophysiological correlates of audition. Prerequisites: SHS 311, 320.

512 Medical Aspects of Speech and Hearing. (3) F, S
Correlation of history and physical findings with pathologic physiology and test results in speech and hearing abnormalities.

516 Physiological Measurements of Auditory Function. (3) S
Theory and application of physiological techniques for assessing the auditory system. 3 hours lecture, 1 hour laboratory. Prerequisite: SHS 502 or 510.

531 Neurophysiology of Hearing. (3) N
The neurophysiological processes of hearing. Prerequisites: SHS 311, 320.

545 Speech Perception and Production. (3) F
Current progress in production and perception of speech. Prerequisite: SHS 375 or instructor approval.

566 Psychology of Language. (3) N
Language and thought in interaction.

574 Fluency Disorders and Treatment. (3) F
Phenomena, etiology, assessment and theories of stuttering are presented followed by various treatment procedures for children and adults who stutter. Prerequisite: SHS 431 or instructor approval.

575 Neurogenic Disorders of Communication: Aphasia. (3) F
Assessment and treatment of acquired neurolinguistic impairment.

576 Neurogenic Aspects of Speech Production: Motor Speech Disorders. (3) S
Evaluation and treatment of the dysarthrias and apraxia of speech. Emphasis on acquired adult disorders.

577 Orofacial Disorders of Communication: Cleft Palate. (3) N
Communication disorders related to anomalies of the orofacial structures. Prerequisite: SHS 310 or instructor approval.

578 Disorders of Voice. (3) S
Communication disorders related to dysfunction of the phonatory and resonance systems of voice production, assessment and treatment. Prerequisite: SHS 310 or instructor approval.

580 Therapy: Practicum. (1-6) F, S, SS
Supervised practicum in communication disorders. One hour staffing and two hours of client contact per week per hour of credit. May be repeated for credit. Prerequisite: instructor approval.

582 Differential Diagnosis of Communication Disorders. (3) F
Procedures for assessing speech/language disorders in children and adults. 3 hours lecture, 2 hours lab. Prerequisite: instructor approval.

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:
(a) Autism and pervasive language disorders
(b) Multiply-handicapped child

Special Courses: SHS 294, 298, 484, 492, 493, 494, 497, 498, 499, 500, 580, 584, 590, 592, 593, 598, 599. (See pages 36-37.)

Women's Studies

The Women's Studies Program is an interdisciplinary university program, housed in the College of Liberal Arts and Sciences. 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:
MAGENTA (Art); K. B. VALENTINE (Communication); NILSEN (Curriculum and Instruction); DOVE, LIGHTFOOT, SHINN (English); GIFFIN, WARNICKE (History); JOHNSON, KELLY (Justice Studies); SHAFER (Educational Leadership and Policy Studies); WELLS (Health and Physical Education); EISENBERG, RUSSO (Psychology); COUDROGLOU (Social Work); GORDON (Sociology)

ASSOCIATE PROFESSORS:
BRANDT (Anthropology); C. VALENTINE (Communication); EDELSKY (Elementary Education); GREENE (English); AHERN, LOSSE, RODD, VASQUEZ (Foreign Languages); BAKER (Family Resources and Human Development); ROTHSCHILD (History); DATESMAN, JURIK (Justice Studies); ALLISON (Leisure Studies); COOK (Management); WILLIAMSON (Music); DANTICO (Political Science); CHASSIN (Psychology); METHA , MOORE (Psychology in Education); NIGG (Public Affairs); BENIN, SMITH, WEITZ (Sociology)

ASSISTANT PROFESSORS:
MORGAN, SENSIBAR (English); GRUZINSKA (Foreign Languages); FUCHS, STONER (History); FERRARO, ZATZ (Justice Studies)

Major Requirements

Bachelor of Arts and Bachelor of Science Degree Curricula

Women's Studies. Consists of 45 semester hours; 30 of these hours must be in women's studies, 15 in a single discipline other than women's studies, which constitute the student's related field. At least 30 of the 45 semester hours required for the major must be completed in upper-division courses. In addition, 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.

Required courses. Five courses are required. Students must complete (1) WST 100 or 300; (2) WST 498; (3) an upper-division course which provides an historical perspective on the lives and contributions of women; (4) an upper-division course that provides a humanities/fine arts perspective on the lives and contributions of women and (5) 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.

The historical perspective requirement may be fulfilled by completing FRE 431 (or an approved special topics course); HIS 333, 370, 371, 422. The humanities perspective requirement may be fulfilled by completing ARA 485; ENG 461, 462; FRE 431; REL 390 (or an approved special topics course). No course may be used to satisfy more than one requirement.

Electives in a single discipline. Majors must complete fifteen hours of 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 and Sciences. In exceptional cases, a student may be permitted to focus on courses from more than one department. A student must secure approval for such a program of study through a petition.

Women's Studies Minor Requirements

The Women's Studies minor consists of 18 semester hours. Required courses are WST 100 (or 300), 498; and 12 additional hours of approved women's studies courses taken after consultation with a women's studies advisor.

Certificate Program in Women's Studies

The Certificate Program is equivalent to an interdisciplinary minor and is recommended for students outside the College of Liberal Arts and Sciences, graduate students and nondegree students. Students majoring in another field may wish to have a Certificate in Women's Studies. (See page 86 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. *[Satisfies General Studies Requirements: SB, H]*

294 Special Topics. (3) F, S, SS
Topics vary by semester; check with Program Office for current description.

300 Women in Contemporary Society. (3) F, S, SS
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. *[Satisfies General Studies Requirement: SB]*

484 Undergraduate Internship. (1-6) F, S, SS
Advance approval of Program Director required.

494 Special Topics. (3) F, S, SS
Topics vary by semester; advance approval of program director required. *[Third World Women satisfies General Studies Requirement: G]*

498 Pro-Seminar: Theoretical Issues in Women's Studies. (3) A
Reading and research on important theoretical issues in women's studies. *[Satisfies General Studies Requirements: L2, SB]*

499 Independent Study. (1-6) F, S, SS
Topic agreed on in advance by instructor and student; approval of Program Office required.

590 Readings and Conference. (1-6) F, S, SS
Topic arranged in advance between student and instructor; approval of Program Office required.

591 Seminar. (1-6) F, S, SS
Topics vary by term; contact Program Office for current listing.

598 Special Topics. (1-6) F, S, SS
Topics vary by term; contact Program Office for current information.

The following courses are available through departments. 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	**316**	**Women and Communication**
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**
JUS	**422**	**Women and Crime**
JUS	**560**	**Women and Crime**
PGS	**331**	**Sexual Identification**
REL	**390**	**Women and Religion**
SOC	**417**	**Family Violence**
SOC	**464**	**Women's 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:
KAMMER (LS C-226), ALCOCK, ALVARADO, CHURCH, DOANE, FISHER, HADLEY, HAZEL, LAWSON, McGAUGHEY, MINCKLEY, OHMART, PATTERSON, RASMUSSEN, WOOLF
ASSOCIATE PROFESSORS:
CHANDLER, COLLINS, FAETH, FOUQUETTE, GOLDSTEIN, JUSTUS, RISSING, RUTOWSKI, SATTERLIE, A. SMITH, WALSBERG
ASSISTANT PROFESSORS:
CAPCO, GALAT, MARTIN, MOORE, G. SMITH
INSTRUCTOR:
MILSTEIN
PROFESSORS EMERITI:
BENDER, CAZIER, CLOTHIER, COLE, GERKING, HANSON, LANDERS, STAHNKE

Departmental Major Requirements

Bachelor of Science Degree Curriculum

Biology. Offered jointly by the Department of Zoology and the Department of Botany; students are advised by a member of either department. 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 43 hours and 20 hours in supplementary areas, plus a mathematics proficiency. Required major courses (31 hours) are BIO 181, 182, 320, 340; BOT 300, 360 (or ZOL 360); MIC 205 (or 220), 206; ZOL 350. The remaining 12 hours are to be selected so the total major hours reflect a balance between the two departments. Required supplementary courses are CHM 113, 115, 231 (or 331, 332, 335, 336); CSC 181 (or 183); MAT 210 (or any calculus); PHY 101 (or 111, 112, 113, 114).

Zoology. Consists of 34 hours in major courses and 27 hours in required supplementary courses plus math proficiency. Required are: BIO 181, 182, 320, 340, 445; ZOL 280, 330, 331, 360; plus one of CHM 113, 115; ZOL 270 (or 350 or 354); and either of the following sequences: CHM 331, 332, 335, 336 (or 231, 361); CSC 181 (or 183); MAT 210 (or any calculus); PHY 111, 112, 113, 114. Mathematics proficiency requirement: MAT 115, 210 (or 270, 271, 272; or 290, 291; or any calculus).

Wildlife Biology. Two options are available:

The *wildlife management option* consists of 63 hours in major and supplemental courses, plus mathematics proficiency. Required are: BIO 181, 182, 217, 320, 340, 415; BOT 370; CHM 113, 115, 231 (or 331, 332, 335, 336); COM 225; ERA 370 (or 360); MAT 210 (or any calculus); ZOL 354 (or 471 or 472), 360, 411, 412; and an additional, approved upper-division Plant course (BOT or ERA).

The *fisheries management option* consists of 61 hours in major and supplemental courses, plus mathematics proficiency. Required are: BIO 181, 182, 217, 320, 340, 415, 426; CHM 113, 115, 231; COM 225; MAT 210 (or any calculus); ZOL 270, 350, 360, 413, 473.

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 Minor Requirements

The Zoology minor consists of 24 semester hours in BIO and ZOL courses, to include BIO 181, 182, plus 16 hours to be selected with approval of an advisor in the Department of Zoology; at least 12 hours must be upper division. Courses not available for credit in the Zoology major cannot be used for the minor (e.g., BIO 100, ZOL 201).

Bachelor of Arts in Education Degree Curriculum

Departmental Major Teaching Field Requirements

Biological Sciences. Offered jointly by the Department of Zoology and the Department of Botany, the major consists of a minimum of 42 semester hours, plus at least 9 hours in supporting courses. Required major courses are BIO 181, 182, 320, 340; BOT 300 (or 370), 360; MIC 205 (or 220), 206; 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 205 (or 220), 206; and 8 additional hours in courses listed under biology, botany, microbiology and zoology, with the *exception* of the following: BIO 100, 218; BOT 108; ZOL 113, 300, 318. Supporting course: BIO 480 is required in addition to the 24 semester hours 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 Catalog* for requirements.

BIOLOGY

BIO 100 The Living World. (4) F, S
Principles of biology. Cannot be used for major credit in the biological sciences. 3 hours lecture, 3 hours lab. *[Satisfies General Studies Requirements: S1, S2]*

181, 182 General Biology. (4) F, S
Biological concepts emphasizing fundamental principles and the interplay of structure and function at the molecular, cellular, organismal and population levels of organization. 3 hours lecture, 3 hours lab. For majors in biological sciences and preprofessional students in health-related sciences. Prerequisite for 182: BIO 181. Secondary school chemistry strongly recommended. *[Satisfies General Studies Requirement: S1 (181), S2 (181, if not used to satisfy S1); 182]*

217 Introduction to Fisheries and Wildlife Management. (3) F
Management of fisheries and terrestrial wildlife, emphasizing management of ecosystems. Designed for prospective wildlife biologists. Prerequisite: 8 hours of biology.

218 Medical History. (1) F
Brief survey of humankind's important inventions and discoveries in the art and science of medicine, illustrating interrelationships of medical ideas.

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

301 Field Natural History. (1) N
Organisms and their natural environment. 2 weekend field trips and a field project. Cannot be used for major credit in the biological sciences. Pre- or corequisite: BIO 300.

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

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

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. *[Satisfies General Studies Requirement: G]*

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. 3 hours lecture, 1 hour recitation. Prerequisite: BIO 182†.

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. 3 hours lecture, 3 hours lab. Prerequisite: MAT 210† or equivalent. *[Satisfies General Studies Requirement: N2]*

420 Computer Applications in Biology (3) F
Computer analysis techniques in biology emphasizing data entry, management and analysis and graphic portrayal. Employs mainframe and microcomputers. Prerequisites: BIO 182; MAT 115; or instructor approval. *[Satisfies General Studies Requirement: N3]*

424 Ecosystems. (3) F '89
Structure and function of terrestrial and aquatic ecosystems, with emphasis on productivity, energetics, biogeochemical cycling and systems integration. Prerequisite: BIO 320 or equivalent.

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

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) N
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
Eukaryotic cell functions as effected by intracellular compartmentation. Emphasis on the application of electron microscopic analyses, cell fraction and selected biochemical procedures. Prerequisites: BIO 332 or BOT 360 or ZOL 360 or equivalent; CHM 231 or 331 or equivalent.

435 Biomembranes. (3) N
Structure and function of biological membranes, emphasizing synthesis, fluidity, exocytosis, endocytosis and cell responses to hormones and neurotransmitters. Prerequisites: BIO 332 or equivalent; CHM 231 or 331 or equivalent.

441 Cytogenetics. (3) F '88
Chromosomal basis of inheritance. Prerequisite: BIO 340†.

442 Cytogenetics Laboratory. (2) F '88
Microscopic analysis of meiosis, mitosis and aberrant cell division. 6 hours lab. Pre- or corequisite: BIO 441†.

443 Molecular Genetics. (3) F
Nature and function of the gene. Prerequisites: BIO 340†; 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. 2 hours lecture, 3 hours lab. Prerequisite: 20 hours in the biological sciences.

512 Transmission Electron Microscopy. (4) F, S
Theory, use and methods of preparing biological materials for transmission electron microscopy. Materials fee. 2 lectures, 6 hours lab. Prerequisite: instructor approval.

515 Scanning Electron Microscopy. (2) SS
Theory and use of scanning electron microscope for biological materials. Intensive five-week mini course. Materials fee. 3 hours lecture, 6 hours lab. Prerequisite: instructor approval.

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 instructor approval.

526 Quantitative Ecology. (3) N
Sampling strategies, spatial pattern analysis, species diversity, classification and applications of multivariate techniques to ecology. 2 lectures, 3 hours lab. Prerequisites: one course in ecology; BIO 415† or equivalent.

Special Courses: BIO 294, 394, 484, 492, 493, 494, 497, 498, 499, 590, 591, 592, 598, 599. (See pages 36-37.)

ZOOLOGY

ZOL 113 Contemporary Zoology. (4) F, S
Topics emphasizing socially relevant problems. Cannot be used for major credit in the biological sciences. 3 hours lecture, 3 hours lab.

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. 3 hours lecture, 3 hours lab. *[Satisfies General Studies Requirement: S2]*

202 Human Anatomy-Physiology. (4) F, S, SS
Continuation of ZOL 201. Cannot be used for major credit in the Department of Zoology. 3 hours lecture, 3 hours lab. Prerequisite: ZOL 201 or instructor approval.

241 Human Genetics. (3) F, S
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) S
Characteristics, classification, evolution and natural history of the major groups of vertebrate animals. 3 hours lecture, 3 hours lab. Prerequisite: BIO 182†.

280 Animal Behavior. (3) F
Evolutionary, genetic, physiological and ecological bases of animal behavior. Prerequisite: 4 hours of BIO or ZOL; or instructor approval.

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. 6 hours lab. Prerequisite: BIO 182†.

316 History of Biology. (3) N
Focuses on 19th and 20th centuries, considering biology as a discipline, evolution and problems of heredity, development and cell theory. Cross-listed as HPS 330. Prerequisite: 6 hours in life sciences.

318 History f Medicine. (3) N
Scientific study of the human body, changing theories of disease evolution of opinions on treatment, emerging institutionalization of medical practice. Cross-listed as HPS 331. Prerequisite: 6 hours in life sciences.

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. Two 3-hour labs. Prerequisite: BIO 182†. ZOL 330 recommended.

350 Comparative Invertebrate Zoology. (4) F
Characteristics, life cycles, adaptational biology and evolution of invertebrate animals. 3 hours lecture, 3 hours lab. Prerequisite: BIO 182† or instructor approval.

354 General Entomology. (4) S '90
Form, activities and classification of insects. 3 hours lecture, 3 hours lab. Prerequisites: BIO 182†.

360 Basic Physiology. (4) F, S
Physiological mechanisms of the higher vertebrates. 3 hours lecture, 3 hours lab. Prerequisites: BIO 182†; CHM 115†; MAT 115.

380 Sociobiology. (3) S
Survey of animal and human social behavior examined from an evolutionary perspective. Suitable for non-majors. 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. Cannot be used for major credit in life sciences. Prerequisite: junior standing.

411 Wildlife Habitat Management. (4) F
Principles, practices and techniques of managing habitats for wildlife. 3 hours lecture, 3 hours lab or field trips; weekend field trips. Prerequisites: BIO 217, 320; ZOL 471, 472; or instructor approval.

412 Wildlife Population Management. (4) S
Principles, practices and techniques for managing wildlife populations. 3 hours lecture, 3 hours lab or field trips; weekend field trips. Prerequisite: ZOL 411.

413 Fisheries Management (4) F '89
Principles and theory of fisheries management. 3 hours lecture, 3 hours lab or field trips, weekend field trips. Prerequisite: 10 hours of biology.

420 Field Zoology. (3) N
Experience in zoological field techniques. Requires weekend or longer field trips. Prerequisite: instructor approval.

423 Population and Community Ecology. (3) N
Organization and dynamics of population and communities, emphasizing animals. Theoretical and empirical approaches. Prerequisite: BIO 320† or instructor approval.

425 Animal Ecology. (3) N
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. 3 hours lecture, 3 hours lab. Prerequisite: BIO 182† or instructor approval.

440 The Nucleus. (3) S '89
Experimental studies in chromatin and chromosome structure. Molecular mechanisms of chromosome movement and mechanics, cell population kinetics, the nucleolus and the nuclear envelope. Prerequisites: BIO 340†; CHM 261†, 335† or 361†.

441 Principles of Human Genetics. (3) F '88
Genetics in human populations, including medical aspects. Prerequisite: BIO 340.

454 Aquatic Insects. (3) F '88
Systematics and ecology of aquatic insects. Prerequisite: ZOL 354†.

460 Comparative Physiology. (4) F '89
The analysis of function in invertebrates and vertebrates, emphasizing evolutionary trends in physiological systems. 3 hours lecture, 3 hours lab. Prerequisite: ZOL 360† or equivalent.

465 Neurophysiology. (3) S '90
Detailed treatment of cellular and organismal neurophysiology and nervous system function. Prerequisite: ZOL 360†.

466 Neurophysiology Laboratory. (2) S '90
Intracellular and extracellular electrophysiological recording techniques, histological preparations and dye-filling techniques. 6 hours Laboratory. Pre- or corequisite: ZOL 465†.

468 Mammalian Physiology. (4) S '89
Detailed treatment of mammalian organ system functions emphasizing integrative mechanisms. 3 hours lecture, 3 hours lab. Prerequisite: ZOL 360† or equivalent.

469 Cellular Physiology. (4) F '88
Emphasizing the molecular basis for cell structure and function. 3 hours lecture, 3 hours lab. Prerequisites: ZOL 360; organic chemistry.

470 Systematic Zoology. (3) S '89
Philosophy, theory and practice in interpreting patterns of animal diversity, including species concepts and speciation, nomenclature and taxonomy, evolutionary and phylogenetic classification. Prerequisites: junior standing; 18 hours in life science.

471 Ornithology. (3) S '90
The biology of birds. 2 hours lecture, 3 hours lab. Weekend field trips. Prerequisite: ZOL 270† or instructor approval.

472 Mammalogy. (4) F '88
Classification, structure, habits, ecology and distribution of mammals, emphasizing North American forms. 3 hours lecture, 3 hours lab or field trip. Weekend field trips. Prerequisite: ZOL 270† or instructor approval.

473 *Ichthyology.* (3) S '89
Systematics and biology of recent and extinct fishes. 2 hours lecture, 3 hours lab or field trip. Weekend field trips required. Prerequisites: ZOL 270†, 425†; or instructor approval.

474 Herpetology. (3) S '90
Systematics and biology of recent and extinct reptiles and amphibians. 2 hours lecture, 3 hours lab or field trip. Prerequisite: ZOL 270†.

481 *Research Techniques in Animal Behavior.* (3) S '90
Experimental and field studies of animal behavior; description and quantification of animal behavior, interpretation of behavior within an evolutionary framework. 1 hour lecture, 6 hours lab. Prerequisite: ZOL 280.

515 Populations: Evolutionary Genetics. (3) F
Mathematical models in the description and analysis of the genetics of populations. Prerequisites: BIO 320†, 415†, 445†; or instructor approval.

516 Populations: Evolutionary Ecology. (3) S
Principles of population biology and community ecology within an evolutionary framework. 2 hours lecture, 2 hours recitation. Prerequisites: BIO 415† (or MAT 210†), 320†; ZOL 515†.

532 Developmental Genetics. (3) S '89
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†.

566 *Environmental Physiology.* (3) F '89
Physiological responses and adaptations of animals to various aspects of the physical environment. Prerequisites: BIO 320†; ZOL 360†.

591 Seminar. (1-3) F, S
Topics such as the following will be offered:

(a)	Behavior	(e)	Physiology
(b)	Cell Biology	(f)	Evolution
(c)	Ecology	(g)	Adaptations
(d)	Genetics	(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 36-37.)

College of Architecture and Environmental Design

John Meunier, M.Arch.
Dean

Purpose

The practice of architecture and environmental design is the culturally responsible shaping of our environment from the scale of the cities we live in, to the buildings and interiors we inhabit, to the artifacts and products we use. What we design must be durable, useful, beautiful, appropriate to its context and must not be a waste of resources, energy and materials. Designing our environment is both an art, a technology and a social science that has a history as long as human culture. The goals of the faculty include offering students an education that becomes the basis for life-long growth and improvement as professionals, advancing the discipline in both theory and practice, and improving the quality of the environment by making the expertise and knowledge of the faculty available to other professionals and to the public.

Organization

Academic Organization. The college is composed of three academic units: the School of Architecture, the Department of Design and the Department of Planning. A fourth unit, the Professional Development Office, provides special programs for the public and offers advanced professional courses. Administration of the college is the responsibility of the dean, who in turn is responsible to the president of the university through the vice president for Academic Affairs.

College Facilities. The College of Architecture and Environmental Design building, opened in 1969, provides space for the college's activities. Facilities include design studios, lecture and seminar rooms, technology laboratories, offices for faculty, administration and student organizations, the Howe Architecture Library, the Gallery of Design, the Media Center, the Shop, the Slide Collection and computer laboratories. A major addition is under construction and is scheduled for occupancy in the spring of 1989.

Howe Architecture Library. As a branch of the University Library, the Howe Library provides easy access to books, periodicals and reference materials for students, faculty and the professional community. The collection includes more than 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 space for traveling exhibitions and exhibitions of student and faculty work.

Special Facilities. College programs are supported by several kinds of special laboratories. The college operates a computer-aided design and graphics laboratory that is adjacent to a computer laboratory managed by university Computing Services. The college's photographic laboratory and darkroom provide high-quality equipment and space for research projects. A shop, equipped to handle wood, plastic and metal supplements studio space. The college's Media Center includes traditional graphics and audio-visual equipment as well as portable video equipment. The Slide Collection, with more than 10,000 slides, is available for instructional use. The college also maintains a solar workshop and materials testing equipment.

Degrees

Undergraduate. The college offers curricula leading to a four-year undergraduate degree: Bachelor of Science in Design. Students select one of the following majors within the respective academic units.

School of Architecture

B.S. Design, major in Architectural Studies

Department of Design

B.S. Design, major in Design Science
B.S. Design, major in Industrial Design
B.S. Design, major in Interior Design

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. Completion of a lower-division program does not guarantee advancement to 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. Three degrees are offered: the professional degree, Master of Architecture (M.Arch.), the multi-disciplinary degree, Master of Environmental Planning (M.E.P.) with a major in Environmental Planning, and the Master of Science (M.Sc.) degree with a major in Building Design.

Admission

Lower-Division Programs. New and transfer students who have been admitted to the university and have selected a college major are admitted to the lower-division program of their choice. A separate application procedure is required for entry to 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 appropriate academic units. Transfer course work must be equivalent in both content and level of offering. In addition, a review of samples of work (portfolio of work) from previous studio classes is required.

Upper-Division Programs. Admission to upper-division programs is competitive. Consult requirements for each major for details. Students applying to more than one program must make separate application to each and must submit separate portfolios. Students not enrolled at ASU when they apply to upper-division programs must in addition make a separate application to the university. Students not admitted to the upper division are not dismissed from the university and may reapply or may transfer to other programs. Students who plan on reapplying should contact the college academic advisor. Transfers into upper-division programs are considered only if vacancies occur and are 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 academic units and the *Graduate Catalog*. Students must make separate applications and be admissible to both the Graduate College and to the academic unit administering the degree program selected.

Advisement

While the college and its academic units provide academic advising, *it is ultimately the responsibility of each student to fulfill academic and program requirements.* Advising and recordkeeping for lower-division programs is the responsibility of the college academic advisor. Records for upper-division program students are kept in the appropriate academic units and advising is by the faculty and the head of the academic unit. General career advising is available from all faculty members. Administration of program requirements is the responsibility of the head of the academic unit and the dean.

Appeals Procedures. Academic appeals and requests for variances are typically first made to the student's advisor, then, if necessary, to the head of the appropriate academic unit, the College Standards Committee and finally, the dean. Students who feel they have been unjustly treated in academic or other matters relating to their career as students may contact the college academic advisor or may take their grievance to the college ombudsperson.

Degree Requirements

Students seeking the Bachelor of Science in Design degree must satisfactorily complete a curriculum of a minimum of 134 to 140 semester hours depending on the major. These requirements include six hours of English proficiency and meet or exceed the General Studies requirement for the university.

Bachelor of Science in Design

Major in:	*Semester Hours*
Architectural Studies	134 or 135
Industrial Design	136
Interior Design	140
Design Science	136 or 140
Urban Planning	134
Housing and Urban Development	134

Dean's List. Undergraduate students who earn 12 or more graded semester 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 of achieving the distinction of being listed on the Dean's List appears on the final grade report for that semester.

Special Honors at Graduation. At the time of graduation, students with academic distinction are awarded the respective designation *cum laude, magna cum laude* or *summa cum laude*. Also see university requirements for graduation with academic recognition, page 68. The college also participates in the ASU Honors Program and offers courses accepted in that program.

General Studies Requirements

Each curriculum offered by the college meets or exceeds the General Studies requirements of the university. Courses are regularly reviewed to determine whether or not they meet one or more General Studies course credit requirements. See the listing of courses by core and awareness area, pages 45-66.

The following key to General Studies credit abbreviations applies to each curriculum offered in the college:

Key to General Studies Credit Abbreviations

L1	Literacy and Critical Inquiry Core Courses (Intermediate level)
L2	Literacy and Critical Inquiry Core Courses (Upper division)
N1	Numeracy Core Courses (Mathematics)
N2	Numeracy Core Courses (Statistics and Quantitative Reasoning)
N3	Numeracy Core Courses (Computer Applications)
HU	Humanities and Fine Arts Core Courses
SB	Social and Behavioral Science Core Courses
S1	Natural Science Core Courses (Introductory)
S2	Natural Science Core Courses (Additional Courses)
G	Global Awareness Courses
H	Historical Awareness Courses

Academic Standards

Lower-Division 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 2.00. Students on probation must observe rules or limitations the College Standards Committee imposes on their probation as a condition of retention. If after one semester on probation, the overall GPA is not at least a 2.00 and the conditions of probation have not been met, the student will be disqualified for a minimum of two full academic semesters. Appeals may be made to the College Standards Committee. Also see university retention standards, pages 40-43.

Upper-Division Retention Standards. Students in upper-division programs are placed on probation when they fail to meet *any* of the following requirements:

1. Failure, incomplete, or withdrawal from any required course,
2. A semester GPA below 2.00,
3. A grade of "D" or "E" in a design studio or a design laboratory,
4. Violation of the college *Code of Student Responsibilities* or any admission agreement.

Students on probation must observe rules or limitations that their Standards Committees place on their probation as a condition of continuation. Students will be removed from programs if:

1. After one semester on probation the requirements imposed are not met or the overall GPA is not above 2.00,
2. Failures or withdrawals in required courses are not resolved at the next offering of the course,
3. Failures or withdrawals from required sequential courses are not resolved,
4. Incompletes in required sequential courses are not completed before the first day of class of the next semester.

Students removed from programs are not guaranteed reinstatement in the program even if probation requirements or requirements placed on readmission are fulfilled. Appeals may be made first to the appropriate academic unit and, if necessary, to the college Standards and Appeals Committee. Also see university retention standards, pages 40-42.

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. Students are to submit a written request for an incomplete to the instructor. This 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 appropriate program head (upper-division students) and the college academic advisor (lower-division students). An incomplete in an upper-division course that is a prerequisite for sequential courses automatically places the student on probation and denies enrollment in subsequent courses. Also see university requirements on incompletes, page 39.

Withdrawals. University withdrawal regulations apply to lower-division courses. Because the college's upper-division curricula are modular and sequential and space in the programs is limited, students are expected to progress through their curriculum with their class. Withdrawal from a required upper division course automatically places a student on probation. Withdrawal from a required upper division course in a required sequence automatically removes the student from the program beginning the subsequent semester. Also see university requirements on withdrawals, page 39.

Credit/No Credit. The only courses accepted toward graduation with a grade of pass-fail or credit/no credit are transfer freshman composition courses, internships and field studies.

Foreign Study. The College of Architecture and Environmental Design maintains active communications with several foreign institutions offering professional course work similar to the 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 the head of their academic unit at the earliest possible date of any intentions for foreign study.

Exchange programs currently exist with the Universitat Stuttgart, West Germany and the Universidad Autónoma de Guadalajara, Guadalajara, Mexico. A foreign study program in London and summer off-campus courses are offered by the School of Architecture.

Students are also encouraged to consider foreign travel for either a semester or an entire academic year. A leave of absence must be requested for foreign study and foreign travel. Each academic unit reserves the right to evaluate the content and the student's competency in each of the courses completed at foreign institutions.

Internships. Upper-division students in the college are required to complete an internship program during the summer between the third and fourth year.

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. Copies of the *Code of Student Responsibilities* are available from the Office of the Dean and the college academic advisor.

Attendance. Attendance is expected at all classes, laboratories and seminars and is a criteria for evaluating performance. Absences and missing work due to absences may result in failure of a course or academic probation. A student may not be excused from submitting work or from a class except for medical reasons or other serious personal conditions beyond the control of the student. Requests for special consideration 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, page 1.

Employment. It is difficult for students in professional programs to carry part-time employment while in school. Acceptance to any of the college's upper-division 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.

Retention of Student Work. The college reserves the right to retain any or all projects or work submitted to meet course requirements for the college's future instructional, publication and exhibition use.

Student Leave of Absence. Upper-division students who withdraw from classes or do not continue sequentially in enrollment must request both a leave of absence and readmission in writing from the head of the appropriate academic unit. 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 their written request for readmission prior to May 1 for the fall semester of the year of return, 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 program in Architecture leads to the Master of Architecture degree, which is accredited by the National Architecture Accrediting Board. The Bachelor of Science in Design with a major in Interior Design is accredited by the Foundation of Interior Design Education and Research. The following programs maintain affiliations with the following accrediting agencies: Planning–American Planning Association; Industrial Design–Industrial Design Society of America.

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 practicing professionals. The college also calls on the members of the Architecture Guild of Arizona State for advice and to promote the goals of the college.

Council for Design Excellence. The Council for Design Excellence has been created to consolidate a partnership between the College of Architecture and Environmental Design and key community leaders who share a vital interest in the development of high quality in the built environment of the Phoenix metropolitan area. By joining together professionals, business and civic leaders, students and faculty in a common pursuit of design excellence the council seeks to make a profound difference in the quality of life.

Affiliations. The College of Architecture and Environmental Design maintains active affiliations with the following organizations:

ARCHITECTURE – 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;

INDUSTRIAL DESIGN – the Industrial Designers Society of America;

INTERIOR DESIGN – the American Society of Interior Designers, the Interior Design Educators Council, the Institute of Business Designers;

PLANNING – the American Planning Association, the Association of Collegiate Schools of Planning and the American Society of Landscape Architects.

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:

American Institute of Architecture Students

College of Architecture and Environmental Design Pre-Studies Organization

School of Architecture

PROFESSORS:
SCHLUNTZ (ARCH 140), BOYLE, COOK, ERIBES (ASU WEST CAMPUS), McSHEFFREY, MEUNIER, PETERSON

ASSOCIATE PROFESSORS:
McGINTY, SCHEATZLE, SHEYDAYI

ASSISTANT PROFESSORS:
BERTELSEN, CHRISTENSEN, FELLOWS, FIFIELD, FINDLEY, McINTOSH, UNDERWOOD, WU, ZYGAS

PROFESSORS EMERITI:
ELLNER, HINSHAW, JAKOB, OLIVER, RUMMEL, STRAUB, WHIFFEN

Purpose

The architecture program at Arizona State University offers an integrated curriculum of professional courses and focuses on the design laboratory. The program reflects an awareness of the complex factors affecting the quality of the built environment. It seeks through scholarship, teaching, research, design and community service to develop the discipline and the knowledge necessary to address the important environmental and design issues faced by society.

In addition to developing knowledge and skills in architectural design, building technology and professional practice, students are expected to select electives to achieve an emphasis in one of several areas including solar and energy conscious design, computer-aided architectural design, architectural administration, urban design and building technology.

Organization

The School of Architecture's program is organized by the faculty under the direction and administration of the director. Subject matter within the school is categorized in the following instructional areas:

Architectural Administration and Management. AAD courses focus on the organizational and management aspects of architectural practice including management coordination, administrative procedures, ethics, legal constraints and the economics of practice.

Architectural Design and Technology Studios. ADE courses require the synthesis of knowledge and understanding gained from other course work and develop an understanding of design theory and design skill through a series of comprehen-

sive design projects. Students apply analytical methods, compare alternative solutions and develop sophisticated technical and conceptual results.

Architectural Philosophy and History. APH courses develop an understanding of architecture as both a determinant and a consequence of culture, technology, needs and behavior in the past and present. Studies are concerned with theory as well as the rationale behind methods and results of design and construction. Case studies are both American and international.

Architectural Technology. ATE courses develop knowledge of the technical determinants, resources and processes of architecture. These studies focus on the science and technology of design and construction, including materials, building systems, acoustics, lighting, structural systems, environmental control systems, computer applications to design and technology, and both passive and active solar systems. Emphasis is on measurable and quantifiable aspects.

Environmental Analysis and Programming. ANP courses develop the ability to analyze and program environmental and human factors as preconditions for architectural design using existing and emerging methods of evaluation and analysis.

Architectural Communications. AVC courses develop the student's understanding of communication theory as it applies to architectural design and practice as well as skills in drawing, graphics, photography, presentation design and the design process.

Architecture Professional Studies. ARP courses provide students with residency and off-campus opportunities and educational experience in group and individual studies relative to specific student interests and faculty expertise including summer internships and field trips.

Degrees/Majors

The faculty of the School of Architecture offer three degrees: the Bachelor of Science in Design with a major in Architectural Studies; the Master of Architecture; and the Master of Science with a major in Building Design.

The six-year degree program in architecture culminates with the professional degree, Master of Architecture, which is accredited by the National Architectural Accrediting Board.

The professional program consists of the final four years of course work.

In cooperation with the College of Business, a dual degree program, Master of Architecture/Master of Business Administration, has been established. Students contemplating dual matriculation are advised to select electives appropriate to this program at the undergraduate level.

The degree, Master of Science in Building Design, provides opportunities for advanced and specialized studies and research in building science. Areas of emphasis include computer-aided design, passive solar design and energy technology design and analysis, and advanced architectural administration. Students entering this program typically have the professional Bachelor of Architecture or Master of Architecture degree, or undergraduate degrees in areas such as physics, engineering or design. For particulars see the *Graduate Catalog*.

Admission

Lower-Division Program. New and transfer students who have been admitted to the university and who have selected architectural studies are admitted to the lower-division architecture program without separate application to the School of Architecture. Transfer credits for the lower-division program are reviewed by the college faculty. To be admissible to this curriculum, transfer courses must be equivalent in both content and level of offering. A review of samples of work is required for studio classes. Consult the college academic advisor for an appointment. Completion of lower-division requirements does not assure acceptance to the upper-division professional program.

Entering lower-division students who are not prepared to enroll in some courses in the required curriculum (for example, calculus or a second course in computer programming) are required to complete additional university credit course work. These prerequisite courses do not apply to the bachelor of science in design degree.

Upper-Division Professional Program. Admission to the upper-division, professional-level program is competitive and is awarded to those applicants demonstrating the highest promise for professional success, including evidence of ability and prospect for future significant public service.

Transfer students who have completed the equivalent required course work may apply to the upper-division program. Prior attendance at Arizona State University is not required. Applicants who already hold a bachelor's degree in another field may be accepted to the upper-division program if they have accomplished the lower-division requirements. Students with 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 profes-

sional degree in architecture) should apply directly to the graduate program.

To be eligible for application to the upper-division program, the following is required:

1. A certificate of admission to Arizona State University. Note that application to the upper-division program is separate from application to the university.
2. Completion of lower-division requirements (a minimum of 63 hours) or equivalents as approved by the college academic advisor and the faculty of the school.
3. A minimum university cumulative grade point average (GPA) of 3.00 as well as a 3.00 GPA based only on the required lower-division courses or equivalents.
4. Submission of a portfolio. (For detailed information about this requirement see the following section, "Application Procedures.")

In an unusual circumstance, when the admission standard deficiency is slight, written evidence of extenuating circumstances is convincing and promise for success is evident, a student may be granted admission to the upper-division on a *provisional* basis. Students not admitted to the upper-division program are not dismissed from the school and may reapply or may transfer to other programs. Students who intend to reapply should meet with the college academic advisor.

Applications for transfer into the upper-division professional program are considered only if vacancies occur. Transfer applicants must demonstrate equivalent course work has been completed and applicants must be academically competitive with continuing students.

Advisement

Advising for the lower-division curriculum is through the college academic advisor. Advising for the upper-division curriculum is by faculty advisors.

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 lower-division 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.

The professional degree, Master of Architecture, requires an additional 56 hours of approved graduate-level course work. For detailed information consult the *Graduate Catalog*.

School of Architecture
Lower-Division Requirements
Option A[1]

			Semester Hours
English (6)			
ENG	101	Freshman Composition	3
		or ENG 105 if qualified	
ENG	102	Freshman Composition	3
		or HU elective if ENG 105	
Literacy and Critical Inquiry (3)			
COM	225	Public Speaking[2]	3
		or approved communication substitute	
Numeracy (12)			
MAT	210	Brief Calculus[2]	3
		or approved calculus substitute	
MAT	219	Mathematical Structures[2]	3
		or approved mathematics or statistics elective	
ECE	105	Introduction to Languages of Engineering[3]	3
		or approved programming language	
ECE	106	Introduction to Computer-Aided Engineering[2]	3
		or approved programming language	
Humanities/Fine Arts (13)			
APH	100	Introduction to Environmental Design I[2]	2
APH	101	Introduction to Environmental Design II[2]	2
Approved Humanities/Fine Arts electives[2]			9
Social/Behavioral Sciences (9)			
ECN	112	Microeconomic Principles[2]	3
		or ECN 111 Macroeconomic Principles	
Approved Social/Behavioral Science electives[2]			6
Natural Sciences (8)			
PHY	111&R	General Physics and Recitation[2]	3
PHY	113	General Physics Laboratory[2]	1
PHY	112&R	General Physics and Recitation[2]	3
PHY	114	General Physics Laboratory[2]	1
Studio Courses[4] **(12)**			
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
		Lower-Division Minimum Total	63

[1] Transfer credits are reviewed by the college and evaluated as admissible to this curriculum. To be admissible, transfer courses must be equivalent in both content and level of offering.

[2] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[3] See prerequisites for ECE 105. These may be completed in high school.

[4] Portfolio review is required for transfer studio work. See the college academic advisor for an appointment.

School of Architecture
Lower-Division Requirements
Option B[1]

			Semester Hours
English (6)			
ENG	101	Freshman Composition	3
		or ENG 105 if qualified	
ENG	102	Freshman Composition	3
		or HU elective if ENG 105	
Literacy and Critical Inquiry (3)			
COM	225	Public Speaking[2]	3
		or approved communication substitute	
Numeracy (19)			
MAT	290	Calculus I[2]	5
MAT	291	Calculus II	5
MAT	274	Differential Equations	3
ECE	105	Introduction to Languages of Engineering[3]	3
ECE	106	Introduction to Computer-Aided Engineering[2]	3
Option B Engineering Requirements (2)			
ECE	210	Engineering Mechanics I: Statics	2
ECE	312	Engineering Mechanics II: Dynamics[4]	3
ECE	314	Introduction to Deformable Solids[4]	2
ECE	383	Probability and Statistics[4]	2
Humanities/Fine Arts (7)			
APH	100	Introduction to Environmental Design I[2]	2
APH	101	Introduction to Environmental Design II[2]	2
Approved Humanities/Fine Arts electives[2]			3
Social/Behavioral Sciences (6)			
ECN	112	Microeconomic Principles[2]	3
		or ECN 111 Macroeconomic Principles (3)	
Approved Social/Behavioral Science electives[2]			3
Natural Sciences (10)			
PHY	115	University Physics[2]	4
PHY	116	University Physics Laboratory[2]	1
PHY	117	University Physics[2]	4
PHY	118	University Physics Laboratory[2]	1
Studio Courses[5] (12)			
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	Fundamentals II	3
		Lower-Division Minimum Total	65

[1] Transfer credits are reviewed by the college and evaluated as admissible to this curriculum. To be admissible, transfer courses must be equivalent in both content and level of offering.

[2] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[3] See prerequisites for ECE 105. These may be completed in high school.

[4] These courses may be taken at the upper-division level as approved electives and are not required prior to admission to the upper-division program. However, course time conflicts can be avoided by taking them before applying to the upper-division.

[5] Portfolio review is required for transfer studio work. See academic advisor for an appointment.

School of Architecture
Upper-Division
Professional Program Requirements

Junior Year

			Semester Hours
Fall (17)			
ADE	321	Architectural Design/Process Determinants	3
ANP	331	Environmental Analysis	3
APH	313	History of Western Architecture I[1,2]	3
ATE	353	Architectural Construction I	3
ATE	361	Building Structures I[3]	3
AVC	301	Architectural Communications I	2
Spring (17)			
ADE	322	Architectural Design/Environmental Determinants	5
ANP	431	Architectural Programming Methods[2]	3
APH	314	History of Western Architecture II[1,2]	3
ATE	351	Environmental Control Systems	3
ATE	362	Building Structures II[3]	3
Summer (3)			
ARP	484	Internship	3

Senior Year

Fall (17)			
ADE	421	Architectural Design/Human and Behavioral Determinants	5
APH	446	20th Century Architecture I[2]	3
ATE	461	Building Structures III[3]	3
ATE	452	Environmental Control Systems II	3
Approved professional emphasis elective			3
Spring (17)			
ADE	422	Architectural Design/Societal Determinants	5
APH	447	20th Century Architecture II	3
ATE	462	Building Structures IV[3]	3
ATE	451	Architectural Construction II	3
Approved professional emphasis elective			3
		Upper-Division Total	71
		B.S. Design Minimum Total	134

[1] These courses may be completed prior to admission to the upper-division. If already completed, students may substitute an approved professional emphasis elective.

[2] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[3] Approved substitute courses are accepted from College of Engineering and Applied Sciences for option B students.

General Information

Upper-Division Professional Program Application Procedures. Students should write to the college academic advisor for the application form well in advance of the application deadline. For additional information on portfolios, ask for a copy of the *Portfolio Seminar* brochure from the college academic advisor.

Upper-Division Application Deadlines. *April 15.* Portfolio and application documents due in the school office (Arch 140) by 4:00 P.M.

June 13. If the spring 1989 semester includes transfer course work (i.e., course work taken at an institution other than Arizona State University), this is the deadline by which a student must submit his/her own transcripts to the school. These may be copies. A second set of official transcripts must be sent to the university Office of Undergraduate Admissions. Application is not complete until the university receives official transcripts for transfer course work. (For those transfer students whose academic term ends in June rather than May, this deadline may be extended upon the written request of the applicant.)

July 1. Acceptance notices mailed.

Return of Letter of Acceptance. A signed receipt of acceptance of admission must be received by the school by the date indicated on the Notice of Acceptance. Alternates may be accepted at a later date if space becomes available.

Matriculation. Accepted students are expected to begin their upper-division professional program at the beginning of the immediate fall term. There is no spring admission to the upper-division.

Portfolios are available for return after July 16.

Portfolio Format Requirements. Each applicant is responsible for obtaining the following documents and including them in the portfolio. Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves (8½" x 11" format only). The student's name is to be affixed to the outside. Items must appear in the following order:

Page 1. Application form, completely filled out with page 1 visible. (Application forms are available from the college academic advising office.)

Page 2. Application form with page 2 visible.

Page 3. All high school transcripts. Put all these into one sleeve.

Page 4. College transcripts. Include all college transcripts for both ASU and transfer work. Includes all work through the Fall 1988 semester. Copies are acceptable. The academic advisor will forward your spring 1989 ASU transcripts. (For those with spring semester 1989 transfer work, the student is responsible for submitting these transcripts by June 13 so they may be added to their portfolio. The student is also responsible for getting an official transfer transcript sent directly to the Office of Undergraduate Admissions.)

Page 5. ASU Certificate of Admission (or Readmission). This may be a copy.

Following Pages (usually 10-20 sheets). Include sufficient examples of studio and laboratory work to show the depth of your design and drawing skills. Include freehand and hardline drawings and examples of two and three dimensional design and graphics. Include a concise caption for each item that explains the work and list other pertinent information as applicable, as well as names of other team members, length of project, course and project descriptions.

Students are encouraged to include additional materials, written or pictorial, that provide additional evidence of skills and abilities, as well as aptitude and commitment to the major. When any work submitted is not completely original, the source must be given. When work is of a team nature, the applicant's role should be clearly indicated. Original examples or slides must not be submitted. All examples must be photographs or other reproduction graphic media.

Return of Portfolios. Application documents (pages 1-5) remain the property of the department. However the remaining portfolio will be returned after admissions review provided the applicant encloses a self-addressed return mailer with sufficient prepaid postage. Portfolios may be claimed in person after July 16. If the applicant provides written permission another person may claim the portfolio. After one year unclaimed portfolios are discarded. While care will be taken in handling the portfolios, no liability for lost or damaged materials is assumed by the college or the school.

Professional Emphasis Electives. Students, with the approval of their advisor, select their required upper-division professional emphasis electives from the following areas: architectural office management (also courses in the College of Business), construction technology and administration (also courses in the Department of Construction), landscape architecture (also courses in the Departments of Planning, Botany, and the School of Agribusiness and Environmental Resources), structural systems design (also courses in the College of Engineering and Applied Sciences), architectural history, theory, or preservation (also courses in art history in the College of Fine Arts, or philosophy in

the College of Liberal Arts and Sciences), 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 and adaptive reuse (also courses in the Department of Planning), urban and regional planning, environmental psychology and sociology, interior architecture (also courses in the Department of Design), computer-aided design (also courses in the Department of Computer Science) and advanced architectural communications.

General Studies Requirements

The architecture curriculum exceeds the General Studies requirements of the university. For more information about university General Studies requirements see pages 42-45. Specific courses in the curriculum that fulfill the required General Studies distribution requirements are indicated with a letter and number code, see page 172 for the key.

ARCHITECTURAL ADMINISTRATION AND MANAGEMENT

AAD 551 Architectural Management I. (3) F
Organizational, human performance and market influences on the architecture firm and its projects. Readings, case studies and analysis of managerial problems and solutions. Lecture, discussion. Prerequisite: AAD 560 or instructor approval.

552 Architectural Management II. (3) S
Elements of project and financial management in architectural firms. Decision modeling, resource planning and control. Readings and case studies. Lecture, discussion. Prerequisite: AAD 560 or instructor approval.

553 Construction Contract Administration I. (2) F
Construction contract administration including budget control, scheduling, cash flow, changes and claims and monitoring systems for traditional, fast-track and design-build methods. 2 hours lecture, 3 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 instructor approval.

555 Architect as Developer. (3) F, S
Development building, real estate, construction funding, land acquisition and the sources for capital. Prerequisite: instructor approval.

558 Specifications and Cost Analysis. (3) S
Coordination of working drawings, construction specifications and cost estimates. Emphasis on methods, office procedures, contract conditions, bonds and bidding procedures. Lecture. Prerequisite: graduate-level standing or instructor approval.

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 instructor approval.

Special Courses: AAD 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

ARCHITECTURAL DESIGN AND TECHNOLOGY STUDIOS

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. 1 hour lecture, 6 hours studio. Cross-listed as DSC 221. Prerequisite: major in college.

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. 1 hour lecture, 6 hours studio. Prerequisites: major in college; ADE 221; AVC 141, 160.

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, studio and field trips. Prerequisite: instructor approval.

322 Architectural Design/Environmental Determinants. (5) S
Building and site design in response to site, climate and other environmental determinants. Housing and other building types. Lecture, studio 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. People and their behavior as a primary architectural determinant. Lecture, studio and field trips. Prerequisites: ADE 322; ARP 484.

422 Architectural Design/Societal Determinants. (5) S
Comprehensive development of multi-building complexes relating to community, cultural and urban services. Emphasis on societal needs and expectations. Lecture, studio and field trips. Prerequisite: ADE 421.

521 Advanced Architectural Design I. (5) F
Building design within an urban context. Lecture, studio and field trips. Prerequisite: ADE 422 or approved equivalent.

522 Advanced Architectural Design II. (5) S
Building design which integrates major building systems, in large structures and complexes. Lecture, studio and field trips. Prerequisite: ADE 521.

532 Earth Sheltering Techniques. (3) S
Principles of earth sheltering for energy conscious building, including orientation, structure, insulation, moisture proofing and building codes. Prerequisite: ATE 551.

621 Advanced Architectural Design III. (5) F
Selected topics in complex buildings. Lecture, studio and field trips. Prerequisites: ADE 522; instructor approval.

622 Architectural Design IV. (5) S
Individual student-initiated final studio project emphasizing a final synthesis of major architectural design determinants. Studio. Prerequisites: ADE 621 or equivalent; instructor approval.

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 instructor approval.

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: ADE 661.

Special Courses: ADE 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

ENVIRONMENTAL ANALYSIS AND PROGRAMMING

ANP 331 Environmental Analysis. (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 Architectural Programming Methods. (3) S
Theory and methods of architectural programming including determinants of architecture, information gathering techniques, program preparation and methods of evaluation. Prerequisite: professional-level standing. *[Satisfies General Studies Requirement: L2]*

433 Building Codes and Ordinances. (3) N
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 for architectural problems and applications. Lecture, lab. Prerequisite: CSC 183 or equivalent.

477 Computer Applications to Design Problems. (3) F
Examination of generic microcomputer software in solving architectural design problems. Emphasis on the logic of problem formulation. Lecture, lab. Prerequisite: instructor approval.

530 Computer Graphics in Architecture. (3) N
Fundamentals of computer graphics programming in architecture; including graphics hardware, device independent packages, two and three dimensional transformations and data structures. 2 hours lecture, 3 hours lab. Prerequisite: ANP 475 or instructor approval.

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 instructor approval.

561 Architectural Information Processing Systems. (3) S
Applications of information processing systems to architectural problems. Analysis of computing tools with respect to assumptions and theories. Lecture, lab. Prerequisites: graduate standing; instructor approval.

562 Information Systems for Facilities Management. (3) F
Introduction to database design and implementation. Assessment of facility management problems from information system points of view. Seminar, lab. Prerequisites: ANP 477 or 561; graduate standing.

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 on Architectural Practice. (2) F, S
Examination of societal issues confronting the practice of architecture. Seminar. Prerequisite: graduate standing or instructor approval.

Special Courses: ANP 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

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 as PUP 100. *[Satisfies General Studies Requirements: HU, G, H]*

101 Introduction to Environmental Design II. (2) F, S
Survey of environmental design issues, responsibilities and directions. Cross-listed as PUP 101. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: G, H]*

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. *[Satisfies General Studies Requirements: G, H]*

304 American Architecture. (3) N
Architecture in the U.S. from earliest colonial times to present. Non-architecture majors only. *[Satisfies General Studies Requirements: HU, H]*

305 Contemporary Architecture. (3) N
Europe and America from the foundations of the modern movement to the present. Non-architecture majors only. *[Satisfies General Studies Requirements: HU, G, H]*

311 Survey of Mexican Architecture. (2) N
Overview of historical through contemporary example of Mexican architecture, landscape and urban design. *[Satisfies General Studies Requirements: HU, H]*

313 History of Western Architecture I. (3) F
Representative buildings and sites with emphasis on their physical and social settings from antiquity through the middle ages. Prerequisite: junior standing or instructor approval. *[Satisfies General Studies Requirements: HU, H]*

314 History of Western Architecture II. (3) S
Representative examples of architecture and urban design with emphasis on their social and historical contexts; from the middle ages to the present. Prerequisite: junior standing or instructor approval. *[Satisfies General Studies Requirement: H]*

348 Theory of Built Environments. (3) N
Focused study of built environmental forms, their theoretical foundation and relation to social processes. Cross-listed as PUP 320. Prerequisite: sophomore standing. *[Satisfies General Studies Requirement: HU]*

411 History of Landscape Architecture. (3) F
The physical record of human attitudes toward the land. Selected examples of ancient through contemporary landscape planning and design. Cross-listed as PLA 310.

414 History of the City. (3) F
The city from its ancient origins to the present day with emphasis on cities of Europe and America during the last five centuries. Cross-listed as PUP 412.

441 Ancient Architecture. (3) N
Architecture of the ancient Mediterranean world with selective emphasis on major historical complexes and monumental sites. Prerequisite: APH 313. *[Satisfies General Studies Requirements: HU, H]*

442 Preservation Planning. (3) F
Principles and practices in planning for preservation, conservation and neighborhood redevelopment. Emphasis on evaluation of historic resources. Off-campus field practicum required. Cross-listed as PUP 444. Prerequisite: instructor approval.

443 Renaissance Architecture. (3) N
Selected examples of Renaissance architecture and urbanism with emphasis on their historical and cultural settings. Prerequisite: APH 314. *[Satisfies General Studies Requirements: HU, H]*

444 Baroque Architecture. (3) N
Selected examples of Baroque architecture and urbanism with emphasis on relationships between architecture and other arts. Prerequisite: APH 314. *[Satisfies General Studies Requirements: HU, H]*

445 19th Century Architecture. (3) N
Architecture and urbanism in Europe and North America from the French Revolution to Art Nouveau. Emphasis on the challenge of new materials and techniques in the context of revived and traditional architecture. Prerequisite: APH 314. *[Satisfies General Studies Requirements: HU, H]*

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. *[Satisfies General Studies Requirements: HU, G, H]*

447 20th Century Architecture II. (3) S
Developments in architecture since the international style. Prerequisite: APH 446. *[Satisfies General Studies Requirements: HU, G, H]*

681 Architectural Theory. (3) N
An examination of architectural theory. Emphasis on application of theory to practice. Seminar. Prerequisite: Instructor approval.

682 Architectural Criticism. (3) N
An examination of architectural criticism, emphasizing specific methods of criticism and their application for aesthetic judgment. Seminar. Prerequisite: instructor approval.

Special Courses: APH 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

ARCHITECTURAL TECHNOLOGY

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. 2 hours lecture, 3 hours lab. Prerequisite: admission to upper-division.

353 Architectural Construction I. (3) F
Basic materials and methods of architectural construction for residential scaled systems. Includes effects of zoning and code requirements. Lecture, lab. Prerequisite: admission to upper-division.

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. Lecture, lab. Prerequisite: admission to upper-division.

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. Lecture, lab. 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. Lecture, lab. 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. 2 hours lecture, 3 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. Lecture, lab. 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.

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 to meet the thermal energy requirements of buildings. Lecture. 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. Prerequisites: ATE 521; MAT 290.

542 Building Thermal System Simulation and Optimization. (3) S
Mathematical models of building envelope and comfort conditioning systems will be developed to simulate building energy systems; optimization techniques are also presented. Prerequisite: ATE 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: ATE 541.

550 Passive Cooling in Buildings. (3) N
Theory, classification and evaluation of passive and low energy cooling systems for thermal comfort in buildings. Lecture. Prerequisite: ATE 452.

551 Passive Heating. (3) F
Theory, classification and evaluation of low energy heating systems for thermal comfort in buildings. Prerequisites: ATE 452, 521.

552 Advanced Modeling of Passive Systems. (3) S
Advanced computer-aided evaluation techniques to determine environmental influence on comfort in passive and low energy heated and cooled buildings. Prerequisite: ATE 551 or instructor approval.

553 Building Systems I. (3) F
Principles of lighting, daylighting and acoustics and their application in the design of buildings. Prerequisite: admission to upper-division or instructor approval.

554 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: ATE 452.

557 Construction Documents I. (3) F
Production of architectural working drawings; legal status organization, layout, site survey plans, sections, elevations, details, schedules and coordination. Laboratory, lecture. Prerequisite: admission to upper-division.

558 Bioclimatic and Energy Parameters for Buildings. (3) S
Analysis and evaluation techniques for design synthesis of energy-related parameters in site, climate, human comfort and building program. Prerequisite: ATE 521.

560 Computer-Aided Energy Analysis. (3) N
Advanced and new algorithms to analyze environmental problems with emphasis on energy performance. Selected topics. Lecture, lab. Prerequisite: ANP 475 or 477.

562 Energy Efficient Systems Evaluation. (3) N
Field performance data of active and passive solar systems and components is compared with fundamental principles and formulations. Prerequisite: ATE 521.

582 Building Systems II. (3) S
Design of building systems including: electrical, plumbing, security, communications, fire protection and transportation. Field trips. 2 hours lecture, 3 hours lab. Prerequisites: ATE 452, 553.

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.

Special Courses: ATE 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

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. 1 hour lecture, 4 hours studio. Prerequisite: major in college.

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. 1 hour lecture, 4 hours studio. Cross-listed as DSC 160. Prerequisite: major in college.

161 Freehand Perspective Drawing II. (2) F, S, SS
Continuation of AVC 160. Introduction of color media, and analytical and design drawing exercises. 4 hours studio. Cross-listed as DSC 161. Prerequisites: major in college; AVC 160.

301 Architectural Communication I. (2) F
Basic graphic skills, drawing conventions, values, graphic symbols and lettering, sketching and presentation vocabulary. 2 afternoons in laboratory per week. Lecture and field trip. Prerequisite: admission to upper-division.

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 instructor approval.

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 instructor approval.

444 Architectural Photography. (2-3) N
Use of photography as a means of architectural study, evaluation and record. Introduction to 35mm camera and darkroom techniques. Lecture, laboratory. Prerequisite: instructor approval.

Special Courses: AVC 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

ARCHITECTURE PROFESSIONAL STUDIES

ARP 451 Architecture Field Studies. (1-6) F, S, SS
Organized field study of architecture in specified national and international locations. Credit/no credit. May be repeated with approval of director.

484 Clinical Internship. (3) SS
Full-time internship under the supervision of practitioners in the Phoenix area or other locales. Credit/no credit. Prerequisite: instructor approval.

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. Credit/no credit. Prerequisite: instructor approval.

Special Courses: ARP 294, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

Design

PROFESSORS:
WOLF (ARCH 141), REZNIKOFF
ASSOCIATE PROFESSORS:
BUSH, KNIGHT, KROELINGER, NIELSEN, WITT
ASSISTANT PROFESSORS:
BRANDT, JOHNSON, QUESADA, SADLER, VERNON
PROFESSORS EMERITI:
BENZINGER, STREUFERT

Purpose

The faculty of the Department of Design offer a curriculum that provides a strong educational foundation for careers in industrial design, interior design and the design professions. Professional interior and industrial designers work within areas requiring an understanding of systems, functions, scientific and technical processes, public welfare and safety, and the study of human factors in design. A major goal of the faculty is to advance the design professions through scholarship, teaching, research and community service.

The curricula of the department's programs integrate lecture, laboratory and studio course work and include both individual and team project experiences. The goal is to develop technically accomplished and conceptually sophisticated graduates who continue to grow and develop as practicing professionals.

Organization

The Department of Design offers three professional programs: Industrial Design, Interior Design and Design Science. The programs are organized by the faculty of the department under the direction and administration of the chair.

Degrees/Majors

The faculty of the Department of Design offer the degree, Bachelor of Science in Design. Three majors are available: major in Industrial Design, major in Interior Design and major in Design Science.

Industrial Design. Industrial Design is primarily concerned with how humans perceive and use designed objects. The discipline of Industrial Design 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 detailed understanding of visual, tactile, safety and convenience criteria. Industrial designers combine these considerations with practical concern for technical processes, the requirements of manufacturing, economics and marketing, including distribution, sales and service.

Interior Design. The program in Interior Design is accredited by the national accrediting agency, the Foundation for Interior Design Education Research. The curriculum emphasizes design process, technical skill development, problem solving and the management skills needed to work in collaboration with the allied design professions. The goal is to create high quality environments for human use.

Significant changes in the interior design profession over the last two decades are reflected in the program. The department is committed to integrating computer technology into each level of the curriculum. In doing so, the program offers an excellent environment for experimenting with and testing innovative applications of computer-aided design and simulation to interior design.

Design Science. The Design Science major is an individualized upper-division program of study for students who are academically above average and who have specific academic and professional goals that are not achievable in the department's two other programs. Design science majors select either a industrial design emphasis (program total 136 hours) or an interior design emphasis (program total of 140 hours) and do not necessarily take studio or laboratory courses. An internship is a part of each curriculum.

Admission

Lower-Division Program. New and transfer students who have been admitted to the university and who have selected industrial design or interior design as a major are admitted to the appropriate lower-division program. Transfer credits for the lower-division program are reviewed by the college and evaluated as admissible to this curriculum. To be admissible, transfer courses must be equivalent in both content and level of offering. A review of samples of work is required for studio classes. Consult the college academic advisor for an appointment.

Entering lower-division students who are not ready to take some courses in the curriculum (for example, algebra and trigonometry or a second

course in computer programming) are required to take remedial courses which do not apply to the Bachelor of Science degree. If these courses are needed it may take an additional year to complete the lower division program.

Completion of lower-division requirements does not assure acceptance to an upper division professional program.

Upper-Division Program. When students have completed the lower division curriculum requirements, they may apply for acceptance to upper division programs in Industrial Design, Interior Design, or Design Science. The limited number of spaces available each year are awarded to applicants with the highest promise for professional success. For detailed information about application requirements see the following section, "Application Procedures."

Students not admitted to upper-division programs are not dismissed from the university and may reapply or may transfer to other programs. Students who intend to reapply should meet with the college academic advisor.

Applicants for admission to the upper division design science program follow the same timetable as interior and industrial design students. Application is made directly to the department chair. Applications must include a proposed curriculum developed in conjunction with a faculty advisor that is acceptable to the department faculty. Applicants must fulfill lower division program requirements in either Industrial Design or Interior Design.

Advisement

Advising for the lower division curriculum is through the college academic advisor. Advising for the upper-division curriculum is by the department chair and faculty advisors.

Degree Requirements

The degree, Bachelor of Science in Design, requires the following minimum number of hours of required and approved courses for its majors:

Bachelor of Science in Design

Major in:	*Semester Hours*
Industrial Design	136
Interior Design	140
Design Science	136 or 140

The program includes required field trips. Students are responsible for these additional costs. Foreign study opportunities are available for honor students. An internship is a required part of the program.

Industrial Design. The curriculum in Industrial Design is divided into a lower-division and an upper division program:

	Semester Hours
Lower Division Program	65
Upper Division Program	71
Total	136

The lower-division curriculum balances a foundation in academic subjects such as English, algebra and trigonometry, computers and physics with departmental courses that include history as well as studio courses in drawing, graphics and design fundamentals.

The upper division curriculum includes studio and laboratory work in industrial design, color theory, materials and manufacturing techniques, as well as lecture courses in human factors, graphic design, design methods and practice. A supervised summer internship is a part of the curriculum.

Upper-division studios emphasize projects which promote an interdisciplinary approach to solving problems and develop the student's 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 stages of the design process: 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.

Industrial Design

Lower-Division Requirements[1]

Freshman Year

			Semester Hours
Fall (15)			
ENG	101	Freshman Composition	3
		or ENG 105 if qualified	
MAT	115	College Algebra and Trigonometry[2]	4
DSC	100	Contemporary International Design[2]	3
ECE	105	Introduction to Languages of Engineering[3]	3
DSC	160	Freehand Perspective Drawing I	2
Spring (17)			
ENG	102	Freshman Composition	3
		or HU elective if ENG 105	
COM	207	Introduction to Communication Inquiry[2]	3
		or COM 222 or COM 225	

PHY 111&R General Physics and Recitation[2] ..3
PHY 113 General Physics Laboratory[2] 1
ECE 106 Introduction to Computer-Aided Engineering[2] 3
DSC 161 Freehand Drawing II 2
Approved Program Elective[4] 2

Sophomore Year

Fall (18)
PGS 100 Introduction to Psychology[2] 3
or approved social/behavioral science
DSC 221 Design Fundamentals I 3
DSC 224 Color 3
DSC 226 Color Sketching 3
DSC 316 20th Century Design I[2] 3
DSC 342 Materials 3

Spring (15)
ECN 112 Microeconomic Principles[2] 3
DSC 317 20th Century Design II[2] 3
DSC 343 Materials (cross-listed as MET 343) ... 3
DSC 225 Design Methods 3
Social/Behavioral Science elective 3
(select from HIS 303, 304; PGS 341; SOC 101, 360)[2]

Lower-Division Total 65

[1] Transfer credits for the lower-division program must be equivalent in both content and level of offering. Samples of studio work must be provided for evaluation. See the college academic advisor for an appointment.

[2] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[3] See prerequisites for ECE 105. These may be completed in high school.

[4] For information about courses that fulfill the approved program elective requirement, see the college academic advisor.

Industrial Design
Upper-Division Requirements

Junior Year

			Semester Hours
Fall (18)			
DSC	344	Human Factors in Design	3
DSC	354	Mechanics of Materials	4
DSC	360	Design Methodology and Techniques	5
ENG	301	Writing for the Professions[1]	3
Approved Program Elective[2]			3
Spring (18)			
DSC	323	Imagining and Presentation for Visual Designers	3
DSC	361	Concept Development	5
DSC	440	Plastics Design	3
Approved Program Elective[2]			3
Natural Science Laboratory elective[1]			4
Summer (3)			
DSC	484	Internship	3

Senior Year

Fall (16)
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
Approved Program Elective[2] 2

Spring (16)
DSC 431 Package Design 3
DSC 461 Systems Synthesis and Design 5
DSC 475 Design Project 3
Approved Program Electives[2] 5

Upper-Division Total 71
B.S. Design minimum Total 136

[1] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[2] A list of courses that fulfill approved program elective requirements is available from the departmental academic advisor.

Interior Design. The curriculum in Interior Design is divided into a lower- and an upper-division program:

	Semester Hours
Lower-Division Program	68
Upper-Division Program	72
Total	140

The lower-division curriculum balances a foundation in academic subjects such as English, algebra and trigonometry, computers and physics with departmental courses that include history and theory, as well as studio courses in drawing, computer graphic and design fundamentals.

The upper-division curriculum includes studio work in interior design, furniture design and drawing, as well as lecture courses in the history of interior design, human factors, interior codes, specifications, environmental technologies and practice. A supervised summer internship is a part of the curriculum.

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 architectural firms, public institutions or industry. Students may also choose to continue their education with graduate studies to enrich their design skills, to specialize, or to prepare for college-level teaching.

Interior Design
Lower-Division Requirements[1]
Freshman Year

			Semester Hours
Fall (15)			
ENG	101	Freshman Composition	3
		or ENG 105 if qualified	
MAT	115	College Algebra and Trigonometry[2]	4
DSC	100	Contemporary International Design[2]	3
ECE	105	Introduction to Languages of Engineering[3]	3
DSC	160	Freehand Perspective Drawing I	2
Spring (17)			
ENG	102	Freshman Composition	3
		or HU elective if ENG 105	
PHY	111&R	General Physics and Recitation[2]	3
PHY	113	General Physics Laboratory[2]	1
ECE	106	Introduction to Computer-Aided Engineering[2]	3
DSC	161	Freehand Drawing II	2
ARS	102	Art of the Western World[2]	3
DSC	223	Introduction to Interior Design[2]	2

Sophomore Year

Fall (18)			
DSC	221	Design Fundamentals I	3
DSC	224	Color	3
DSC	246	Programming for Interior Design	3
DSC	316	20th Century Design I[2]	3
DSC	216	History of Interior Design I[2]	3
ENG	301	Writing for Professionals[2]	3
Spring (18)			
COM	207	Introduction to Communication Inquiry[2]	3
		or COM 222 or COM 225	
DSC	217	History of Interior Design II[2]	3
DSC	220	Interior Rendering	3
DSC	225	Design Methods	3
DSC	324	Color for Interior Design	3
DSC	344	Human Factors in Design	3
		Lower-Division Total	68

[1] Transfer credits for the lower-division program must be equivalent in both content and level of offering. Samples of studio work must be provided for evaluation. See the college academic advisor for an appointment.

[2] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[3] See prerequisites for ECE 105. These may be completed in high school.

Interior Design
Upper-Division Requirements
Junior Year

			Semester Hours
Fall (17)			
DSC	318	Decorative Arts/Cultural Influences[1]	3
DSC	340	Interior Codes: Public Welfare and Safety	3
DSC	341	Interior Materials and Finishes	3
DSC	346	Furniture and Millwork	3
DSC	364	Interior Design Studio I	5
Spring (17)			
CON	366	Construction Methods	3
DSC	319	Decorative Textiles	3
DSC	321	Specifications and Documents for Interiors	3
DSC	365	Interior Design Studio II	5
DSC	458	Lighting for Interior Design	3
Summer (3)			
DSC	484	Internship	3

Senior Year

Fall (17)			
DSC	455	Environmental Control Systems	3
DSC	464	Interior Design Studio III	5
DSC	457	Acoustics for Interior Design	3
Social/Behavioral Science elective[1,2]			3
Approved Program Elective I[3]			3
Spring (18)			
DSC	472	Professional Practice for Interior Design	3
DSC	465	Interior Design Studio IV	5
Natural Science Laboratory elective[1]			4
Social/Behavioral Science elective[1,2]			3
Approved Program Elective II[3]			3
		Upper-Division Total	72
		B.S. Design minimum Total	140

[1] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[2] Select two courses in the same department from:
a. Sociology 301 and 332, 348, 351, 360, or 448; OR
b. Psychology 100 and 306, 350 or 427; OR
c. Anthropology 102 and 351.

[3] These courses may be completed prior to admission to requirements is available from the departmental academic advisor.

General Information

Upper-Division Application Procedures. Students should write to the academic advisor for the application form well in advance of the application deadline. For general information on portfolios, ask for a copy of the *Portfolio Seminar* brochure from the college academic advisor.

Upper-Division Application Deadlines.
April 15. Portfolio and application documents due in the department office (Arch 141) by 4:00 P.M.

June 13. If the spring 1989 semester includes transfer course work, this is the deadline by which a student must submit his/her own transcripts to the department. These may be copies. A second set of official transcripts must be sent to the university Office of Undergraduate Admissions. Application is not complete until the university receives official transcripts for transfer course work.

July 1. Acceptance notices mailed.

July 16. (1) Return of Letter of Acceptance. A signed receipt of acceptance of admission must be received by the department by this date. (2) Notification of admission status for alternates. (3) Portfolios available for return.

Matriculation. Accepted students are expected to begin their upper-division professional program at the beginning of the immediate fall term. There is no spring admission to the upper-division.

Portfolio Format Requirements. Each applicant is responsible for obtaining the following documents and including them in the portfolio. Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves (8½" x 11" format only). The student's name is to be affixed to the outside. Items must appear in the following order:

Page 1. Application form, completely filled out with page 1 visible. (Application forms are available from the college Academic Advising Office.)

Page 2. Application form with page 2 visible.

Page 3. All high school transcripts. Put all these into one sleeve.

Page 4. College transcripts. Include all college transcripts for both ASU and transfer work. Includes all work through the fall 1988 semester. Copies are acceptable. The academic advisor will forward your spring 1988 ASU transcripts. (For those with spring semester 1989 transfer work, the student is responsible for submitting these transcripts by June 13 so they may be added to their portfolio. The student is also responsible for getting an official transfer transcript sent directly to the Office of Undergraduate Admissions.)

Page 5. ASU Certificate of Admission (or Readmission). This may be a copy.

Following Pages (usually 10-20 sheets).

Include sufficient examples of studio and laboratory work to show the depth of your design and drawing skills. Include freehand and hardline drawings and examples of two and three dimensional design and graphics. Include a concise caption for each item that explains the work and list other pertinent information as applicable, including names of other team members, length of project, course and project description.

Students are encouraged to include additional materials, written or pictorial, that provide additional evidence of skills and abilities, as well as aptitude and commitment to the major. When any work submitted is not completely original, the source must be given. When work is of a team nature, the applicant's role should be clearly indicated. Original examples or slides must not be submitted. All examples must be photographs or other reproduction graphic media.

Return of Portfolios. Application documents (pages 1-5) remain the property of the department. However the remaining portfolio will be returned after admissions review provided the applicant encloses a self-addressed return mailer with sufficient prepaid postage. Portfolios may be claimed in person after July 16. If the applicant provides written permission another person may claim the portfolio. After one year unclaimed portfolios are discarded. While care will be taken in handling the portfolios, no liability for lost or damaged materials is assumed.

General Studies Requirements

The Interior Design and Industrial Design curricula meet the General Studies requirements of the university. For more information about university General Studies requirements see pages 42-45. For a key to the letters and numbers on each list of degree requirements see page 172.

DESIGN

DSC 100 Contemporary International Design. (3) F, S
Twentieth-century Western and Asian design in light of the historical events, economic forces, cultural values and aesthetic ideals that have shaped it. 3 hours lecture. *[Satisfies General Studies Requirements: HU, G]*

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. 5 hours studio. Cross-listed as AVC 160. Prerequisite: major in college.

161 Freehand Perspective Drawing II. (2) F, S, SS
Continuation of 160. Introduction of color media, and analytical and design drawing exercises. 5 hours studio. Cross-listed as AVC 161. Prerequisites: major in college; DSC 160.

216 History of Interior Design I. (3) F
The design on interior spaces as expression of cultural influences to 1900. *[Satisfies General Studies Requirements: HU, H]*

217 History of Interior Design II. (3) S
Design of American Interiors as an expression of cultural and technological influence, 1900 to contemporary. Prerequisite: DSC 216 preferred. *[Satisfies General Studies Requirement: H]*

220 Interior Rendering. (3) S
Graphic representation methods used to describe and analyze space, emphasis on quick presentation techniques. 6 hours studio. Prerequisites: DSC 161, 221.

221 Design Fundamentals. (3) F
Exercises in basic visual organization: includes design vocabulary, principles of 2D and 3D composition, color and aesthetic reactions to design. 7 hours studio. Cross-listed as ADE 221. Prerequisite: major in college.

223 Introduction to Interior Design. (2) S
Interiors issues, theories and philosophies. Emphasis on subjective and objective analysis of problems of design and their solutions. *[Satisfies General Studies Requirement: HU]*

224 Color. (3) F
Theory and practice of basic color concepts, color systems, color relationships, psychology of color, color in industry. 2 hours lecture, 2 hours studio. Prerequisite: DSC 161 or equivalent.

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. 2 hours lecture, 2 hours studio. Prerequisite: DSC 221 or equivalent; major.

226 Color Sketching. (3) F, S
Felt markers; quick representational and concept communication sketching. Forms in space; light and shade. Material reflectance properties. 6 hours studio. Prerequisites: DSC 161 or equivalent; Industrial Design major.

228 Electronic Imaging. (3) N
Introduction to the technologies involved in the production of computer graphics for designers in a nontechnical format. 1 hour lecture, 4 hours studio.

246 Programming for Interior Design. (3) F
Design programming and methodologies for interior design; emphasis on user needs and behavior as a basis for design. 3 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. *[Satisfies General Studies Requirements: HU, H]*

317 20th Century Design II. (3) S
Modern European, Asian and American design since 1940. Emphasis on transportation, product, furniture, exhibition and graphic design. *[Satisfies General Studies Requirements: HU, H]*

318 Decorative Arts/Cultural Influences. (3) F
Focus on how diverse cultures have expressed themselves through the decorative arts. May include field trips. Prerequisite: DSC 217. *[Satisfies General Studies Requirement: HU]*

319 Decorative Textiles. (3) S
Investigation of the fabrication and aesthetic qualities of textiles. Cultural and historical expression of design as related to interiors. May include field trips. Prerequisite: DSC 318 or instructor approval.

321 Specifications and Documents for Interiors. (3) S
Contract specifications, documents, schedules and bidding procedures for interior design. Prerequisites: DSC 340, 364.

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. 6 hours studio. Prerequisite: DSC 221.

324 Color for Interior Design. (3) S
Psychological and decorative applications of color; emphasis on the functional and visual effects based upon context. Prerequisite: DSC 224.

340 Interior Codes: Public Welfare and Safety. (3) F
Codes and regulations as performance criteria for interior design.

341 Interior Materials and Finishes. (3) F
General analysis of quality control measures relating to interior design materials, finishes and performance criteria. Prerequisite: DSC 340.

342 Materials. (3) F
Materials application in design. Characteristics and properties of ferrous and nonferrous metals, plastics and elastomers.

343 Material Processes. (3) S
Industrial processing as applied to low, medium and high volume manufacturing. Basic and secondary processing, fastening and joining, coding, quality control. Cross-listed as MET 343. Prerequisite: DSC 342.

344 Human Factors in Design. (3) F, S
Man-machine environment systems; human characteristics and behavior applied to design of products, systems and their operating environment.

346 Furniture and Millwork. (3) F
Design, construction, cost estimating and installation of interior furniture and millwork. 1 hour lecture, 4 hours studio. Prerequisite: departmental approval.

347 Interior Furnishings. (3) N
Evaluation of furnishings in a functional, economic and aesthetic framework. 3 hours lecture. May include field trips. Prerequisite: DSC 223 or TXC 223.

354 Mechanics of Materials. (4) N
Vectors, force systems, friction, equilibrium, centroids and moment of inertia. Concepts of stress, strain and stress analysis applied to beams, columns and combined loading. Cross-listed as MET 354. Prerequisites: MAT 115; PHY 111.

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. 10 hours studio. Prerequisite: departmental approval.

361 Concept Development. (5) S
Emphasis on developing ideas into a complete functional product, including survey and application of aesthetics, human factors, materials and manufacturing. 10 hours studio. Prerequisite: DSC 360.

364 Interior Design Studio I. (5) F
Studio problems in interior design related to behavioral response in personal and small group spaces. 10 hours studio. Prerequisite: departmental approval.

365 Interior Design Studio II. (5) S
Studio problems in interior design with emphasis on issues of public and private use of interior places of assembly. 10 hours studio. Prerequisite: DSC 364.

367 Electronic Packaging. (3) N
Industrial design problems in packaging electronic devices. Emphasis is placed on packaging, displays and controls. Prerequisite: instructor approval.

420 Graphic Design. (3) F
Visual design relating to products, packaging, display and signage. Mixed media. 6 hours studio. Prerequisite: DSC 323.

421 Concept and Style in Presentation Documents. (3) N
Methods of analyzing portfolio design for interiors. Forming presentation concepts and establishing a communications style. Prerequisite: senior standing.

431 Package Design. (3) S
Aesthetic and marketing considerations of containing, protecting and promoting a product through packaging. 6 hours studio. Prerequisite: DSC 420.

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.

454 Kitchen Design. (3) N
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. Field trips. Prerequisites: MAT 115; PHY 111, 113; senior standing.

457 Acoustics for Interior Design. (3) F
Physical properties of sound. Studies pertaining to sound-absorption materials, constructions and room acoustics. Prerequisites: MAT 115; PHY 111, 113; senior standing.

458 Lighting for Interior Design. (3) S
Light as an aspect of interior design. Evaluation of light sources for distribution, color and cost. Prerequisite: senior standing.

460 Unit Analysis and Design. (5) F
Complete analysis of the product unit as an element of mass production emphasizing marketing, packaging, cost development, aesthetics and detailing. Special attention to professional presentation. 10 hours studio. Prerequisite: DSC 361.

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. Ten hours studio. Prerequisite: DSC 460.

464 Interior Design Studio III. (5) F
Studio problems in interior design related to commercial spaces. 10 hours studio. Prerequisite: DSC 365.

465 Interior Design Studio IV. (5) S
Studio problems in interior design related to health and educational facilities. 10 hours studio. Prerequisite: DSC 464.

470 Professional Practice for Industrial Design. (3) F
Business procedures, management techniques, accounting systems, ethical and legal responsibilities of the design professions. May be repeated for credit. Prerequisite: senior standing.

472 Professional Practice for Interior Design. (3) F
Business procedures, project control, fee structures, professional product liabilities. Prerequisite: senior standing.

474 Design Project. (3) F
Large-scale interdisciplinary class project involving project planning and control, design, prototype development, feasibility study and reporting. Prerequisites: senior standing; instructor approval.

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: instructor approval.

494 Special Topics: History of Graphic Design. (3) A
Survey of development in the graphic arts, innovative printing methods, aesthetic values, and social and cultural environments that shape them. Lecture. *[Satisfies General Studies Requirement: HU]*

520 Design Forecasting: Methods and Applications. (3) N
Projected applications in design production, planning and decision-making processes. Lecture, seminar. Prerequisites: DSC 216, 217; or equivalent.

522 Facilities Programming and Management I. (3) N
The facility management process. Types of organizations. Long-range facility programming, planning and management. Project management methodologies using micro-based software programs.

523 Facilities Programming and Management II. (3) N
The formation of facilities policy, procedures and standards. The facilities database, space allocations and management. Productive measurement and evaluation of programming criteria.

524 Illumination and Acoustics. (3) N
Research and laboratory investigation of advanced illumination and acoustics issues of building design. Emphasis on human factors and performance aspects. Prerequisites: DSC 457, 458; or equivalent.

525 Design Methodologies. (3) N
Practical exercises and studies in problem-solving strategies; problem definition and supporting theory for the designer. Lectures, seminars and lab.

527 Modern Design Theory. (3) N
Aesthetic, political, economic and social theories which have shaped modern design; theory as the basis for design philosophies. Lectures, seminars. Prerequisite: DSC 525 or equivalent.

529 Design Criticism. (3) N
Critical methods applied to design as material culture and human expression; evaluation of achievement versus intention. Lecture, seminar. Prerequisite: DSC 527 or equivalent.

544 Human Factors Systems and Documentation. (3) N
Advanced topics associated with theory and methods of human factors in design. Individual projects stressing problem organization, evaluation and documentation. Lectures, seminars, lab. Prerequisite: DSC 344 or equivalent.

552 Computer Simulation in Design. (3) S
The use of computer graphics as a medium to develop and present images of the environment for analysis and perception. Lecture, lab.

553 Computer Imaging and Simulation in Design. (3) S
Issues and applications of computer simulation as a tool for describing and testing human interface with the environment. Lecture, lab.

558 Daylighting. (3) SS
Daylighting as a design determinant; concepts, techniques, methodology, experiments and case studies.

564 Interior Design Studio V. (3) N
Advanced interior design problem solving, design theory and criticism. Specialized projects based upon the major's problem. Studio. Prerequisite: instructor approval.

565 Interior Design Studio VI. (3) N
Advanced series of specialized projects based upon the concentration. Emphasis on individual thematic development. Studio. Prerequisite: instructor approval.

580 Practicum: Methods of Teaching Design. (3) N
Background and development of design education theories. Concepts of studio teaching methods. Comprehensive student project development and evaluation methods. Lecture.

591 Seminar: Graduate Design. (3) N
Design criticism, human/environment problems, design education, sociology of design, occupational safety and health, human factors. Participant presentations. Lecture, seminar.

Special Courses: DSC 294, 394, 484, 494, 498, 499, 500, 580, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

Planning

PROFESSOR:
BURGESS
ASSOCIATE PROFESSORS:
LAI (ARCH 135), KIM
ASSISTANT PROFESSORS:
COOK, GARCIA, PIHLAK
PROFESSOR EMERITUS:
ELMORE

Purpose

The faculty of the Department of Planning offer a curriculum that provides an education for careers in urban and regional planning, landscape architecture and urban development. The goal of the faculty is to advance the profession of planning through scholarship, teaching, research and community service.

Planners work on projects that range in scale from site and landscape development to the design of entire communities and the formulation of policies that shape urban and regional growth. Planning graduates work for both private firms and government agencies. Their work typically involves fields such as urban design, land-use planning, housing, natural resource management and urban transportation.

Organization

The Department of Planning offers two undergraduate professional programs: Urban Planning (with a concentration in landscape architecture or urban planning) and Housing and Urban Development. In addition, a professional graduate program in urban planning is offered. The programs are organized by the faculty of the department under the direction and administration of the chair.

Degrees/Majors

The faculty of the Department of Planning offer the undergraduate degree, Bachelor of Science in Design and the graduate degree, Master of Environmental Planning. The Bachelor of Science in Design includes the following majors and concentrations: major in Urban Planning with a concentration in landscape architecture or urban planning and major in Housing and Urban Development.

Urban Planning (concentrations in Landscape Architecture or Urban Planning). The B.S. in Design with a major in Urban Planning requires four years of study. Following two years of preparatory work, students take two years of courses that include site planning, landscape architecture, urban design, comprehensive planning, socioeconomic and environmental analysis, computer and analytical methods, planning law and public-policy formulation and administration. An internship is required between the third and fourth years. Many students continue planning specialization at the graduate level. Students select from two concentrations, landscape architecture or urban planning.

Students in the landscape architecture concentration explore the reasons for and the techniques involved in the analysis, planning and design of land and the exterior environment, both natural and built. Students in the urban planning concentration are exposed to the theories, methods and interdisciplinary concerns of the profession of urban planning.

Housing and Urban Development. This major familiarizes students with housing technology and housing planning and development in both the public and private sectors. Students interested in this upper-division program should contact the department chair for more information.

Master of Environmental Planning. The Department of Planning offers elective areas in urban planning and urban design under the Master of Environmental Planning degree (M.E.P.). The M.E.P. is an interdisciplinary degree offered by the College of Architecture and Environmental Design. This concentration is a two-year program and includes 18 semester hours of required courses, 27 hours of approved electives, a 3 hour summer internship or approved elective and a 6 hour thesis or research project for a total of 54 semester hours. For further information, see the *Graduate Catalog*.

Admission

Lower-Division Program. New and transfer students who have been admitted to the university and who have selected a program in the Department of Planning as a major are admitted to the lower-division program. Transfer credits for the lower-division program are reviewed by the college and evaluated as admissible to this curriculum. To be admissible, transfer courses must be equivalent in both content and level of offering. A review of samples of work is required for studio classes. See the college academic advisor for an appointment.

Completion of lower-division requirements does not assure acceptance to the upper-division professional program. Admission to the upper-division is competitive and limited to the space available and requires formal application and acceptance.

Upper-Division Program. Admission to the upper-division programs of the Department of Planning 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 success. Spaces in the program are limited by available facilities, faculty and qualified applicants. A lower-division program GPA of 3.00 may be required. For detailed information about application requirements see the following section titled "Application Procedures."

Students not admitted to upper-division programs are not dismissed from the university and may reapply or may transfer to other programs. Students who plan on reapplying should meet with the college academic advisor.

Applications for admission to the upper-division Housing and Urban Development program are made directly to the department chair. Applications must include a proposed curriculum developed in conjunction with a faculty advisor and acceptable to the department faculty.

Advisement

Advising for the lower-division curriculum is through the college academic advisor. Advising for the upper-division curriculum is by the department chair and faculty advisors.

Degree Requirements

The degree, Bachelor of Science in Design, requires the following minimum number of hours of required and approved courses for its majors.

Bachelor of Science in Design

	Semester Hours
Lower-Division courses	65
Upper-Division courses	
Core	34
Approved electives	32
Internship	3
Total	134

Department of Planning
Lower-Division Requirements[1]

			Semester Hours
English (6)			
ENG	101	Freshman Composition	3
		or ENG 105 if qualified	
ENG	102	Freshman Composition	3
		or HU elective if ENG 105	
Literacy and Critical Inquiry (6)			
COM	225	Public Speaking[2]	3
		or approved communication substitute	
PUP	301	Introduction to Urban Planning[2]	3
Numeracy (10)			
MAT	115	College Algebra and Trigonometry[2]	4
Approved statistics or quantitative reasoning[2]			3
Humanities/Fine Arts (9)			
PUP	100	Introduction to Environmental Design I[2]	2
PUP	101	Introduction to Environmental Design II[2]	2
Approved Humanities/Fine Arts elective[2]			2
Approved Humanities/Fine Arts elective[2]			3
		or Social Behavioral Science elective	
Social/Behavioral Sciences (6)			
ECN	112	Microeconomic Principles[2]	3
Approved Social/Behavioral Science electives[2]			3
Natural Sciences (8)			
Approved Natural Science Lab (S1)[2]			4
Approved Natural Science Lab (S2)[2]			4
Electives (13)			
Electives			13
		PLA 301 Introduction to Landscape Architecture recommended	
Studio Courses[3] (10)			
AVC	141	Design Graphics	2
AVC	160	Freehand Perspective Drawing I	2
ADE	221	Design Fundamentals I	3
PUP	264	Planning Communication	3
Lower-Division minimum Total			65

[1] Transfer credits are reviewed by the college and evaluated as admissible to this curriculum. To be admissible, transfer courses must be equivalent in both content and level of offering.

[2] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[3] Portfolio review is required for transfer studio work. See the college academic advisor for an appointment.

Department of Planning
Upper-Division
Professional Program Requirements
Junior Year

			Semester Hours
Fall (17)			
PLA/PUP	361	Landscape Design I (Site Planning)	5
PUP	332	Planning Methods Using Computers[1]	3
Approved concentration electives[2]			9
Spring (17)			
PLA/PUP	362	Landscape Design II (Urban Design)	5
PUP	442	Urban Design	3
PUP	424	Quantitative Methods	3
Approved concentration electives[2]			6
Summer (3)			
PLA/PUP	484	Internship or approved elective	3

Senior Year

Fall (17)			
PLA/PUP	461	Landscape Design III (Urban Planning)	5
PUP	494	Special Topics: Proposal Writing	1
PUP	432	Planning, Society and Law	3
Approved concentration electives[2]			8
Spring (15)			
PLA/PUP	462	Landscape Design IV (Independent Project)	5
PUP	494	Special Topics: Professional Practice	1
Approved concentration electives[2]			9
Upper-Division minimum Total			69
B.S. Design minimum Total			134

[1] This course satisfies a General Studies requirement. See course description for specific requirement(s) each course fulfills.

[2] Courses that fulfill approved concentration electives for the concentrations should be selected in consultation with departmental advisors.

Major: Urban Planning

Concentration: Landscape Architecture (PLA). Students in the landscape architecture concentration explore the reasons for and the techniques involved in the analysis, planning and design of land and the exterior environment, both natural and built. Students fulfill this concentration's requirements by taking a minimum of 32 semester hours of approved concentration electives from the following list:

			Semester Hours
PLA	310	History of Landscape Architecture	3
PLA	442	Landscape Construction and Materials	3
PLA	432	Plant Materials	3
PLA	444	Landscape Architecture Site Preparation	3
PLA	446	Landscape Structures and Systems	3
CON	341	Surveying	3
ERA	325	Soils	3
GPH	372	Air Photo Interpretation	3
CON	472	Land Development Feasibility	3
PUP	442	Environmental Planning	3
PUP/PLA		Special Courses or other approved elective	2
Total			32

Major: Urban Planning

Concentration: Urban Planning (PUP). The concentration in urban planning exposes the student to the theories, methods and interdisciplinary concerns of the urban planning field. Students fulfill this concentration's requirements by taking a minimum of 32 semester hours of approved concentration electives from the following list:

			Semester Hours
GCU	361	Urban Geography	3
PUP	442	Environmental Planning	3
PUP	444	Preservation Planning	3
PUP	412	History of the City	3
CON	472	Land Development Feasibility	3
REA	441	Real Estate Land Development	3
SOC	332	The Modern City	3
TRA	405	Urban Transportation	3
PUP/PLA		Special Courses or other approved electives	8
Total			32

General Information

Upper-Division Application Procedures.

Students should write to the college academic advisor for the application form well in advance of the application deadline. For additional information on portfolios, ask for a copy of the *Portfolio Seminar* brochure from the college academic advisor.

Upper-Division Application Deadlines

April 15. Portfolio and application documents due in the department office (Arch 135) by 4:00 P.M.

June 13. If the spring 1989 semester includes transfer course work, this is the deadline by which a student must submit his/her own transcripts to the department. These may be copies. A second set of official transcripts must be sent to the university

Office of Undergraduate Admissions. Application is not complete until the university receives official transcripts for transfer course work.

July 1. Date acceptance notices are mailed.

July 16. (1) Return of Letter of Acceptance. A signed receipt of acceptance of admission must be received by the department by this date. (2) Notification of admission status for alternates. (3) Portfolios available for return.

Matriculation. Accepted students are expected to begin their upper-division professional program at the beginning of the immediate fall term. There is no spring admission to the upper division.

Portfolio Format Requirements. Each applicant is responsible for obtaining the following documents and including them in the portfolio. Application materials are submitted at one time in a presentation binder (portfolio) with plastic sleeves ($8\frac{1}{2}$" x 11" format only). The student's name is to be affixed to the outside. Items must appear in the following order.

Page 1. Application form, completely filled out with page 1 visible. (Application forms are available from the college Academic Advising Office.)

Page 2. Application form with page 2 visible.

Page 3. All high school transcripts. Put all these into one sleeve.

Page 4. College transcripts. Include all college transcripts for both ASU and transfer work. Includes all work through the fall 1988 semester. Copies are acceptable. The academic advisor will forward your spring 1988 ASU transcripts. (For those with spring semester 1989 transfer work, the student is responsible for submitting these transcripts by June 13 so they may be added to their portfolio. The student is also responsible for getting an official transfer transcript sent directly to the Office of Undergraduate Admissions.)

Page 5. ASU Certificate of Admission (or Readmission). This may be a copy.

Following Pages (usually 10-20 sheets).

Include sufficient examples of studio and laboratory work to show depth of design and drawing skills. Include freehand and hardline drawings and examples of two and three dimensional design and graphics. Include a concise caption for each item that explains the work and list other pertinent information as applicable, including names of other team members, length of project, course and project description.

Students are encouraged to include additional materials, written or pictorial, that provide additional evidence of skills and abilities, as well as aptitude and commitment to the major. When any work submitted 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 Portfolios. Application documents (pages 1-5) remain the property of the department. However the remaining portfolio will be returned after admissions review provided the applicant encloses a self-addressed return mailer with sufficient prepaid postage. Portfolios may be claimed in person after July 16. If the applicant provides written permission another person may claim the portfolio. After one year unclaimed portfolios are discarded. While care will be taken in handling the portfolios, no liability for lost or damaged materials is assumed.

Inquiries. For further information on the lower-division or upper-division programs in planning please contact the College Academic Advisor, College of Architecture and Environmental Design, Arizona State University, Tempe, AZ 85287-1605.

General Studies Requirements

The curriculum for majors in Urban Planning meets the General Studies requirements of the university. For more information about university General Studies requirements see pages 42-45. For a key to the letters and numbers on each list of degree requirements, see page 172.

URBAN PLANNING

PUP 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. 2 hours lecture. Cross-listed as APH 100. *[Satisfies General Studies Requirements: HU, G, H]*

101 Introduction to Environmental Design II. (2) F, S
Survey of environmental design issues, responsibilities and directions. 2 hours lecture. Cross-listed as APH 101. *[Satisfies General Studies Requirements: HU, H]*

264 Planning Communication. (3) S
Communication techniques for urban planning and landscape architecture presentations. Prerequisites: ADE 221; AVC 141, 160.

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, SS
Theoretical and practical aspects of city planning. Interrelationships between physical planning, environment, government and society. Cross-listed as CEE 371.

320 Theory of Built Environments. (3) N
Focused study of built environmental forms, their theoretical foundation and relation to social processes. 3 hours lecture. Cross-listed as APH 348. Prerequisite: sophomore standing. *[Satisfies General Studies Requirement: HU]*

322 Planning Methods Using Computers. (3) F
Planning methods using database, word processors, spreadsheets, CAD and mapping packages on microcomputers.

361 Planning Design I. (5) F
Site Planning: Analysis of natural and cultural features; site systems and implications on site planning and design. Studio. Cross-listed as PLA 361. Prerequisite: department major or instructor approval.

362 Planning Design II. (5) S
Urban Design: Analysis of urban form and design implications within an urban context. Studio. Cross-listed as PLA 362. Prerequisite: PLA/PUP 361 or instructor approval.

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.

412 History of the City. (3) N
The city from its ancient origins to the present day. Emphasis on European and American cities during the last five centuries. Cross-listed as APH 414. *[Satisfies General Studies Requirement: H]*

424 Planning Research Methods. (3) F
Tools useful for urban planning research; emphasis on research design and survey methods. Prerequisite: PUP 301 or instructor approval.

432 Planning and Development Control Law. (3) F
Case studies on police power, eminent domain, zoning, subdivision controls, exclusion, preservation, urban redevelopment, and aesthetic and design regulation.

442 Environmental Planning. (3) N
Environmental planning problems, including floodplains, water quality and quantity, solid and hazardous waste, air quality, landslides and noise. Field trips. Prerequisite: PUP 301 or instructor approval.

444 Preservation Planning. (3) N
Principles and practices in planning for preservation, conservation and neighborhood redevelopment. Emphasis on evaluation of historic resources. Off-campus field practicum required. Cross-listed as APH 442. Prerequisite: instructor approval.

446 Urban Design. (3) S
Analysis of the visual and cultural aspects of urban design. Theories and techniques applied to selected study models.

461 Planning Design III. (5) F
Urban Planning: Collection and analysis of economic, social and environmental data relevant to urban planning; development of land use plans. Studio. Cross-listed as PLA 461. Prerequisite: PLA/PUP 362 or instructor approval.

462 Planning Design IV. (5) S
Independent Project: Students select and develop projects relating to topics of individual interest or desired specializations. Studio. Cross-listed as PLA 462. Prerequisite: PLA/PUP 461 or instructor approval.

484 Internship. (3) F, S, SS (SS1 only)
Full-time internship under the supervision of practitioners in the Phoenix area or other locale. Credit/no credit. Prerequisite: department major or instructor approval.

520 Planning Theories and Processes. (3) S
Review of past and current theoretical developments related to social change perspectives, the role and ethics of planners. Prerequisite: instructor approval.

532 Advanced Urban Planning Law. (3) S
Advanced study on selected issues in planning law, such as urban design controls, exclusionary practices, compensable regulation and tax policy. Prerequisite: PUP 432 or instructor approval.

542 Energy Policy Planning. (3) N
Energy conservation issues and strategies at the neighborhood to metropolitan scale. Prerequisite: ATE 521 or instructor approval.

544 Urban Land Use Planning. (3) N
Theory and methods of urban land use planning, including the rational planning process, comprehensive, functional and neighborhood plans. Prerequisite: PUP 301 or instructor approval.

572 Urban Planning Practicum I. (5) F
Comprehensive planning workshop dealing with actual problems in an Arizona community. Data gathering and analysis, formulation and recommendation of alternative plans and policies. Prerequisite: PUP 520 or instructor approval.

574 Urban Planning Practicum II. (5) N
Applied workshop emphasizing large-scale, physical project planning by either a public agency or private enterprise. Prerequisite: PUP 572 or instructor approval.

584 Internship. (3) F, S, SS (SS1 only)
Internship under the supervision of practitioners in the Phoenix area or other locales. Credit/no credit. Prerequisite: admission to regular graduate student standing or instructor approval.

622 Urban Statistical Analysis. (3) S
Quantitative analysis in the urban context, demographic analysis, data processing, planning application and urban systems. Prerequisite: PUP 424 or instructor approval.

642 Land Economics. (3) S
Economic determinants for urban and regional planning; analytical techniques, elementary market analysis and feasibility studies; economic incentives in urban planning. Prerequisite: instructor approval.

644 Public Sector Planning. (3) N
Urban fiscal problems and public goods provision in state and local governments. Prerequisites: one course in microeconomics; instructor approval.

Special Courses: PUP 484, 494, 499, 500, 580, 583, 584, 590, 591, 592, 593, 594, 598, 600, 680, 683, 684, 690, 691, 692, 693. (See pages 36-37.)

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) N
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) N
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) S, SS
The relevance of landscape architecture to the creation of humanized environments, with emphasis on natural factors.

310 History of Landscape Architecture. (3) N
Physical record of man's attitude toward the land. Ancient through contemporary landscape planning and design. *[Satisfies General Studies Requirement: H]*

361 Landscape Design I. (5) F
Site Planning: Analysis of natural and cultural features; site systems and implications on site planning and design. Studio. Cross-listed as PUP 361. Prerequisite: department major or instructor approval.

362 Landscape Design II. (5) S
Urban Design: Analysis of urban form and design implications within an urban context. Studio. Cross-listed as PUP 362. Prerequisite: PLA/PUP 361 or instructor approval.

432 Plant Materials. (3) N
Natural components of landscape design; characteristics, applications, selection and use. Field trips.

442 Landscape Construction and Materials. (3) F
Characteristics of materials and methods used in landscape architectural construction.

444 Landscape Architecture Site Preparation. (3) N
Landscape construction drawings focusing on site transformations. Topics include grading, earthwork computations, roadway alignments and layout. Prerequisite: admission to department's professional level or instructor approval.

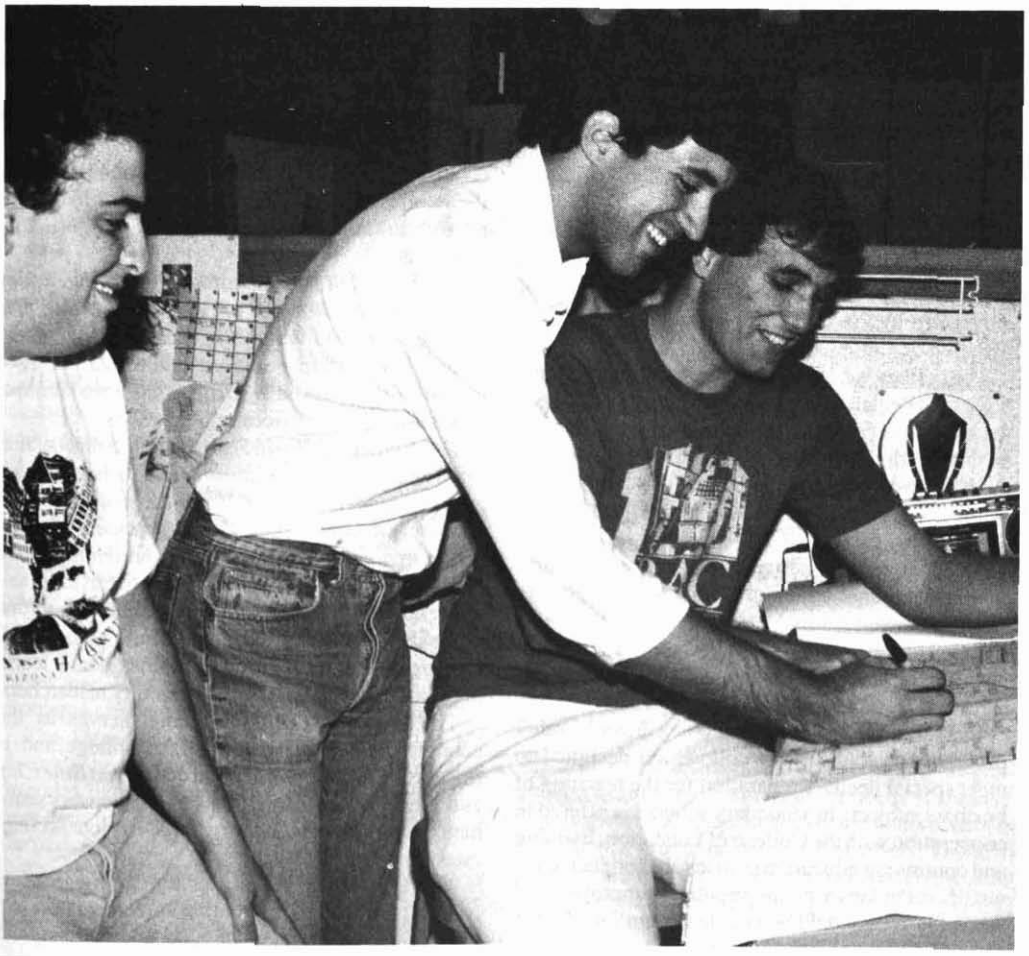
446 Landscape Structures and Systems. (3) N
Landscape construction drawings for structures and systems, including wood construction, retaining walls, irrigation systems, planting, specifications, cost estimating, contract administration. Prerequisite: PLA 444 or instructor approval.

461 Landscape Design III. (5) F
Urban Planning: Collection and analysis of economic, social and environmental data relevant to urban planning; development of land use plans. Studio. Cross-listed as PUP 461. Prerequisite: PLA/PUP 362 or instructor approval.

462 Landscape Design IV. (5) S
Independent Project: Students select and develop projects relating to topics of individual interest or desired specializations. Studio. Cross-listed as PUP 462. Prerequisite: PLA/PUP 461 or instructor approval.

484 Internship. (3) F, S, SS (SS1 only)
Full-time internship under the supervision of practitioners in the Phoenix area or other locales. Credit/no credit. Prerequisite: department major or instructor approval.

Special Courses: PLA 484, 494, 499, 500, 580, 583, 584, 590, 591, 592, 593, 594, 598, 600, 680, 683, 684, 690, 691, 692, 693. (See pages 36-37.)



College of Business

John Kraft, Ph.D.
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, (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 50 percent of work in general education and other non-business courses and 40 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. The undergraduate and graduate programs and the School of Accountancy 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 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 academic units: Accountancy; Decision and Information Systems; Economics; Finance; General Business; Management; Marketing; and Purchasing, Transportation, Operations.

The School of Health Administration and Policy offers a master's degree program designed to prepare qualified individuals for management careers in hospitals, group practices, health maintenance organizations, consulting firms, long-term facilities and other health services organizations.

The Center for Business Research collects, analyzes and disseminates information on the economy and business climate of Arizona. Forecasts and analyses 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 center coordinates interdisciplinary sponsored research efforts which will provide useful information to business and a learning experience for students and faculty researchers.

The Economic Outlook Center serves as the economic forecasting unit of the college and is responsible for the publication of *Arizona Blue Chip* and *Western Blue Chip*. The center sponsors seminars and workshops on the national and local economies.

The Center for Advanced Purchasing Studies (CAPS) is a national affiliation agreement between the College of Business at ASU and the National

Association of Purchasing Management. The CAPS objective is to conduct in-depth research into the problem facing the purchasing profession today and the requirements of the future.

The Center for Office Automation Research provides a research base for business, government and educational organizations seeking aid in the development of automated office systems. The center provides quarterly reports on office automation research, training for working in automated offices and sponsors semi-annual conferences.

The Center for Financial System Research is being established to serve the national financial, policy-making and academic communities through research, publications, conferences and training on topics such as the changing nature of the financial services industry, portfolio management strategies to minimize interest rate risk, financing mergers and acquisitions, the pricing of deposit insurance and the effect of government policy on financial markets.

The Decision Systems Research Center monitors and advances the state-of-the-art in the management of data, information and planning analyses. Members include leading industry and academic professionals in the decision sciences and information systems.

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 Joan and David Lincoln Center for Private and Public Sector Ethics conducts research and offers educational programs on ethical issues in business, government and the professions.

The First Interstate Center for Services Marketing provides research, specialized education and training and management assistance for the professions and to firms engaged in banking, insurance, health care, tourism and transportation.

The Hahn Center for Entrepreneurship and Innovation provides hands-on experience for students together with applied research and interdisciplinary course work for students and entrepreneurs.

The Arizona Real Estate Center collects and analyzes data concerning the multi-faceted real estate market to provide insight into solutions for problems confronting the real estate industry.

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 Economic Club of Phoenix, a subsidiary of the Dean's Council of 100, provides programs that foster discussion of economic and business issues among the academic, business, labor and public sectors of Phoenix.

The Council of Emeritus Advisers, founded by the ASU College of Business and Dean's Council of 100, is a select group of retired executives who advise the dean and invite nationally known experts to Arizona as visiting scholars, lecturers and speakers.

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 11 majors:

Accountancy
Computer Information Systems
Economics
Finance
General Business
Management
Marketing
Operations/Production Management
Purchasing/Materials Management
Real Estate
Transportation

Students who wish to qualify to teach business subjects at the secondary level should major in Secondary Education with subject matter in business. This curriculum leads to the Bachelor of Arts in Education degree and certification for teaching business 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 199.

Master's Degrees

The Master of Business Administration degree, the Master of Health Services Administration degree, the Master of Accountancy degree, the Master of Science degree with a major in Decision and Information Systems, the Master of Taxation and the Master of Science degree in Economics are awarded upon successful completion of programs detailed in the *Graduate Catalog*.

Master of Business Administration. 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 and Sciences have defined a program whereby outstanding students may obtain a Bachelor of Arts or Bachelor of Science within the College of Liberal Arts and Sciences 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 prerequisites for the M.B.A. degree.

Master of Health Services Administration. A program designed to prepare qualified individuals seeking careers as administrators of hospitals and health care organizations, consultants to health management firms, accounting firms and policy makers in state and federal agencies. This preparation is carried out by providing the students with selected theories, tools and techniques–the understanding, analysis and application which are essential for effective health services administration.

The program consists of a minimum of 48 semester hours; 15 hours of business administration, 24 hours of health services administration and 9 hours of electives. Students serve internships and residencies in major organizations throughout the United States and abroad. During the course of their training, students act as consultants to major health care organizations throughout the United States. This is accomplished through the program's innovative graduate technical assistance program (GTAP).

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 accounting information systems/electronic data processing auditing.

Master of Science with a Major in Decision and Information Systems. A specialized program 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 6 hours in required study and 24 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.

Master of Taxation. A specialized program to equip persons with the highly technical and demanding skills required to administer the tax laws in both the private and public sectors of the economy.

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 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.

Degree Requirements

Bachelor of Science in Business. 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
Business Core Curriculum	33
Major	18-21
General Studies Requirements	63
Electives	9-12
Total	126

Business Core Requirements. 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:

			Semester Hours
ACC	211	Introductory Financial Accounting	3
ACC	212	Introductory Managerial Accounting	3
CIS	200	Computers in Business	3
QBA	221	Statistical Analysis	3
GNB	233	Business Communication	3
GNB	305	Legal Environment of Business	3
FIN	300	Fundamentals of Finance	3
OPM	301	Operations and Logistics Management	3
MGT	301	Management and Organization Behavior	3
MKT	300	Principles of Marketing	3
MGT	463	Strategic Management	3
		Total	33

Major Requirements

A major consists of a pattern of 18-21 semester hours in related courses falling primarily within a given subject field. Majors are available in Accountancy, Computer Information Systems, Economics, Finance, General Business, Management, Marketing, Operations/Production Management, Purchasing/Materials Management, Real Estate and Transportation.

General Studies Requirements

Graduation Requirements. All students in the College of Business are required to complete a total of 63 semester hours of combined university General Studies courses. These General Studies and required College of Business courses are enumerated in *Policy Statement 63* 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 the Dean, Undergraduate Programs, in the College of Business prior to enrollment in the course.

General Studies courses are regularly reviewed. For specific requirements and to determine whether a course meets one or more General Studies course credit requirements, see the listing of courses by core and awareness area, pages 45-66. General Studies courses are also identified following course descriptions according to the following key:

Key to General Studies Credit Abbreviations

L1	Literacy and Critical Inquiry Core Courses (Intermediate level)
L2	Literacy and Critical Inquiry Core Courses (Upper division)
N1	Numeracy Core Courses (Mathematics)
N2	Numeracy Core Courses (Statistics and Quantitative Reasoning)
N3	Numeracy Core Courses (Computer Applications)
HU	Humanities and Fine Arts Core Courses
SB	Social and Behavioral Science Core Courses
S1	Natural Science Core Courses (Introductory)
S2	Natural Science Core Courses (Additional Courses)
G	Global Awareness Courses
H	Historical Awareness Courses

Specific courses from the following areas must be taken to obtain the designated *minimum* number of semester hours required for graduation:

	Semester Hours
Humanities and Fine Arts	8
At least one course in humanities and fine arts or social and behavioral sciences must be upper-division.	
Social and Behavioral Sciences	15
Must include two of these: ASB 102, PSG 100, SOC 101. ECN 111 and ECN 112 are *required.* At least one course in social and behavioral sciences or humanities and fine arts must be upper-division.	
Science and Mathematics	14
Must include 2 laboratory sciences, MAT 119 and 210 (or more advanced course).	
Global Awareness and Historical Awareness Courses	
General Studies requirements must include one approved global awareness course and one approved historical awareness course selected from *Policy Statement 63.*	
Other General Studies 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 63 hour minimum (see *Policy Statement 63*). All students must complete ENG 101 and 102 (First-Year Composition) and one of the following communication courses–COM 100, 230, 259–as part of the General Studies requirement.	
Total General Studies Courses	63

Elective Courses. Sufficient elective courses are to be selected by the student to complete the total of 126 semester hours required for graduation. Free electives by business majors are restricted to a maximum of 6 semester hours of ASU business courses.

Pass-Fail. Students majoring in Business may not include among the credits required for graduation any courses taken at this university on a pass-fail basis.

General Regulations. The student should follow the sequence of courses suggested in the four-year curriculum outline and the recommendations of the academic advisor in completing the prescribed background and tool courses in preparation for the subsequent professional program.

Each student, upon entering the professional program in the College of Business, will be assigned a faculty advisor upon the basis of the subject matter field in which he/she is primarily interested. The student, in consultation with a faculty advisor, shall select the necessary upper-division business courses to complete the major.

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 average of 2.50;
2. A minimum 2.25 cumulative grade point average and a grade of "C" or better in the following: all business core curriculum courses numbered below 300; ECN 111, 112 and MAT 119, 210; and
3. At least 32 semester hours in General Studies, including ECN 111, 112 and MAT 119, 210; COM 100 or 230 or 259; a laboratory science class; and two of the following: ASB 102, PGS 100, SOC 101.

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, 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 register for 300- 400-level business courses only if:

1. At the time of registration each student has junior standing (56 semester hours completed),
2. They have a 2.00 cumulative GPA and a 2.00 GPA for all business courses completed at ASU.

Non-business majors are limited to a maximum of 15 semester hours of upper-division business courses (excluding economics courses).

Unclassified Undergraduate Students. Unclassified undergraduate business students will be permitted to enroll in 300- 400-level business courses only during on-line registration and only if:

1. They have at least a 2.50 ASU cumulative GPA, and
2. At least a 2.25 ASU cumulative business GPA at the time of on-line registration, or
3. They have never attended ASU, i.e., they will be given a one semester opportunity to register during on-line registration and establish GPAs at ASU.

Unclassified undergraduate business students are limited to a maximum of 15 semester hours of upper-division business courses (excluding economics courses). Unclassified undergraduate students in other colleges will not be permitted to register for 300- 400-level business courses. All requests for overrides for upper-division accounting courses are processed jointly by the Office of the Dean, Undergraduate Programs and the School of Accountancy. Overrides for these courses are issued only with the specific written approval of the school's director.

Nondegree Graduate Students. Nondegree graduate business students not declaring a degree program will be permitted to enroll in 300- 400-level business courses only during on-line registration and only if:

1. They have at least a 2.50 ASU cumulative GPA, and
2. At least a 2.25 ASU cumulative business GPA at the time of on-line registration, or
3. They have never attended ASU, i.e., they will be given a one-semester opportunity to register during on-line registration and establish cumulative GPAs at ASU.

Nondegree graduate business students are limited to a maximum of 15 semester hours of upper-division business courses (excluding economics courses). Nondegree graduate students in other colleges will not be permitted to register for 300-400-level business courses. All requests for overrides to 300- 400-level accounting courses will be processed jointly by the Office of the Dean, Undergraduate Programs and the School of Accountancy. Overrides for these courses are issued only with the specific written approval of the school's director.

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 Undergraduate Programs Office.

Graduation Requirements. In addition to completion of the pattern of courses outlined on page 199, 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 major taken at this university.
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.

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.

Exceptions. Any exception to the above requirements must be approved by the Standards Committee of the College of Business.

Application for Graduation. A professional program business 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. The introductory course in legal environment of business 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:

	Semester Hours
Pre-professional Courses	30
Accounting	6
Economics	6
Statistical Analysis	3
Computers in Business	3
Business Communication	3
Lower-division Business Electives	9
General Studies	34
English	
Mathematics	
Science	
Humanities and Fine Arts	
Social and Behavioral Sciences	

Four-Year Curriculum Outline

First Year

	Semester Hours
ENG 101, 102	6
ECN 111, 112	6
MAT 119	3
MAT 210	3
General Studies Requirements	13-15
	31-33

Second Year

ACC 211, 212	6
QBA 221	3
CIS 200	3
GNB 233	3
COM 100 or 230 or 259	3
General Studies Requirements	13-15
	31-33

Third Year

FIN 300	3
MKT 300	3
MGT 301	3
OPM 301	3
GNB 305	3
Major, General Studies Requirements and Electives	14
	33

Fourth Year

MGT 463	3
Major, General Studies Requirements and Electives	28
	31
Total	126

Special Studies

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. Reading knowledge of an Asian language is required. The Asian Studies content program must be approved by the Center for Asian Studies (see page 85). 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. 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 86). 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 major 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 Undergraduate Programs 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.

School of Accountancy

PROFESSORS:

SCHULTZ (BA 267A), BOATSMAN, BOYD, FLAHERTY, FRITZEMEYER, HARIED, IMDIEKE, JOHNSON, McKENZIE, PANY, RECKERS, R. E. SMITH, TIDWELL, WILKINSON

ASSOCIATE PROFESSORS:

KAPLAN, KNEER, O'DELL, RENEAU, D. B. SMITH, WYNDELTS

ASSISTANT PROFESSORS:

ANDERSON, CHEWNING, CHRISTIAN, DeBERG, DUNCAN, GRASSO, MITTELSTAEDT, MOECKEL, PEI, REGIER, SHRIVER

PROFESSORS EMERITI:

HUIZINGH, HUNTINGTON, SANDERS

The major in Accountancy 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 Accountancy shall consist of the following 21 semester hours:

			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

Note: All Accountancy majors must complete COM 100, Introduction to Human Communication or COM 230, Small Group Communication; COM 259, Communication in Business and the Professions; ENG 301, Writing for the Professions; PHI 103, Principles of Sound Reasoning; PHI 306, Applied Ethics, as part of their General Studies requirements.

An Accountancy major may take a maximum of 30 semesters hours of upper-division accounting courses as a part of the 126 semester hours required for graduation.

ACCOUNTANCY

ACC 211 Introductory Financial Accounting. (3) F, S, SS
Theory and practice of accounting applicable to the accumulation, external reporting and external uses of financial accounting information. Prerequisite: sophomore standing.

212 Introductory Managerial Accounting. (3) F, S, SS
Selection and analysis of accounting information for internal use by management. Prerequisites: ACC 211; sophomore standing.

301 Management Uses of Accounting. (3) F, S
Uses of accounting information for managerial decision-making, budgeting and control. Prerequisites: ACC 212; non-accountancy major.

315 Financial Accounting and Reporting. (3) N
Accounting theory and practice related to uses of financial statements by external decision makers. Prerequisites: ACC 212; non-accountancy major.

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; professional program business student.

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. Prerequisites: ACC 321 (grade of "C" or higher); professional program business student.

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; MAT 119 (or QBA 222), 210; QBA 221; professional program business student.

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. Prerequisites: ACC 212; professional program business student.

383 Advanced Accounting. (3) F, S
Accounting theory applicable to partnerships, branches, business combinations and non-business organizations. Prerequisites: ACC 322 (grade of "C" or higher); professional program business student majoring in accountancy.

432 Problems in Managerial Accounting. (3) N
Cases and computer applications in decision-making, planning and control and capital budgeting. Prerequisites: ACC 331 (grade of "C" or higher); professional program business student majoring in accountancy.

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. Prerequisites: CIS 200; professional program business student.

452 Advanced Taxation. (3) F, S
Advanced problems in business and fiduciary income tax, estate and gift tax, planning and research. Prerequisites: ACC 351 (grade of "C" or higher); professional program business student majoring in accountancy.

467 Management Advisory Services. (3) N
Concepts and methods of providing advisory services with respect to accounting information systems and financial analysis. Administration of consulting practices. Prerequisites: ACC 447 (grade of "C" or higher); professional program business student.

475 Accounting in Public-Sector Organizations. (3) N
Principles of accounting and reporting, budgeting and financial control systems applied in governmental units and other non-business organizations. Prerequisites: ACC 301 or 331 (grade of "C" or higher); professional program business student majoring in accountancy.

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. Prerequisites: ACC 322, 447 (grades of "C" or higher); PHI 306; professional program business student majoring in accountancy.

495 Contemporary Accounting Theory. (3) F, S
Theory of financial accounting and reporting requirements for profit-oriented enterprises. Prerequisites: ACC 383 (grade of "C" or higher); professional program business student majoring in accountancy.

500 Accounting Survey and Analysis. (3) F, S
Basic accounting concepts and procedures for external reporting and internal use by management. Open only to student without previous credit in accountancy.

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) A
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.

515 Professional Practice Seminar. (3) F, S
History, structure, environment, regulation and emerging issues of the accounting profession.

521 Tax Research. (3) F, S
Tax research source materials and techniques. Application to business and investment decisions. Prerequisite: ACC 351.

533 EDP Auditing. (3) S
Analysis of EDP audit techniques and evaluation methods. Emphasis on current topics such as distributed processing and microcomputers. Prerequisite: ACC 481.

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) N
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 life time, with emphasis on tax planning. Prerequisite: ACC 351.

577 Taxation of Real Estate Transactions. (3) A
Income tax aspects of acquisition, operation, disposal of real estate; syndications, installment sales, exchanges, dealer-investor issues, alternative financing, planning. Prerequisite: ACC 521 or instructor approval.

579 Multinational Taxation. (3) N
Taxation of Multinational Businesses, foreign individuals subject to U.S. income tax and U.S. citizens with foreign residency.

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; MAT 210; or equivalent.

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) F
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 36-37.)

Decision and Information Systems

PROFESSORS:
KIRKWOOD (BAC 549), BURDICK, ECK, HERSHAUER, KAZMIER, MAYER, PHILIPPAKIS, WOOD
ASSOCIATE PROFESSORS:
BROOKS, GREEN, HUSTON, KEIM, O'LEARY, ST. LOUIS, VERDINI
ASSISTANT PROFESSORS:
CARROLL, GOUL, RAMIREZ, ROY, WILSON
PROFESSOR EMERITUS:
McCREADY

The major in Computer Information Systems 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 18 semester hours. The following 15 hours must be included:

			Semester Hours
CIS	235	Computer Information Systems I	3
CIS	330	Interactive Business Systems	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 3 hours of upper-division credit approved in advance by the student's faculty advisor.

Note: All Computer Information Systems majors must complete MAT 242, Elementary 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: CSC 100; MAT 119, MAT 210 or higher level, MAT 242; QBA 221.

Certificate in Quantitative Business Analysis

The program of study leading to the certificate in Quantitative Business Analysis prepares students to use quantitative analysis methods in business practice and also provides a background for graduate studies in quantitatively-oriented business fields. This program is not a substitute for the listed areas of business specialization; rather, the courses required for the certificate add quantitative strength to the student's chosen field of specialization.

The requirements for the certificate are:

1. Completion of a Bachelor of Science degree in Business Administration at Arizona State University.
2. Completion of a minimum of 14 semester hours of approved course work. The following eight (8) hours must be included:

			Semester Hours
MAT	242	Elementary Linear Algebra	2
QBA	321	Intermediate Business Statistics	3
QBA	391	Intermediate Management Science	3

   To complete the certificate, the student shall select an additional six hours of quantitative courses approved in advance by the advisor for the certificate program.
3. Completion of MAT 119, 210, 242; CIS 200; QBA 221, 321, 391; and the additional six hours of approved electives with a minimum grade point average in these courses of 2.50.

NOTES:

1. MAT 270 may be taken in place of MAT 210.
2. Computer Information Systems majors may count CSC 100 in place of CIS 200.
3. Courses taken as part of an approved program of study for the certificate do not count against the college restriction on business free electives.

COMPUTER INFORMATION SYSTEMS

CIS 200 Computers in Business. (3) F, S
Uses of computers in processing business data. Introduction to business programming. Not open to students with credit in a higher-level CIS class. Prerequisite: MAT 210. Pre- or corequisite: ACC 212. *[Satisfies General Studies Requirement: N3]*

235 Computer Information Systems I. (3) F, S
Development of computer-generated business reports from business data files. Use of a high-level, file-oriented language. Prerequisites: CSC 100; MAT 210 or 270, 242; QBA 221.

300 Computers in Business II. (3) N
Introduction to information systems in business. Use of computers for business problem solving. Prerequisites: CIS 200; FIN 300; professional program business student.

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; MAT 119; 210 or 270; professional program business student.

330 Interactive Business Systems. (3) F, S
Algorithms, data structures, dialogue and representation techniques, program generators for interactive applications. Prerequisites: CIS 235; CSC 100.

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: ACC 212; CIS 235; MAT 210 or 270, 242.

420 Business Database Concepts. (3) F, S
Overview, applications and management of business database systems and methods. Prerequisites: CIS 330, 335.

430 Advanced Topics in Information Systems. (3) N
Applications development and advanced programming concepts. Program structure and design. Software development cycle. Prerequisites: instructor approval; professional program business student.

440 Systems Analysis and Design. (3) F, S
Principles and applications of computer-based management information systems and analysis and design. Prerequisite: CIS 420.

500 Information Systems I. (3) F, S
Fundamentals of information systems, including such topics as structured language concepts, file and database systems and systems analysis. Prerequisite: MAT 210.

505 Information Systems II. (3) A
Data structures for information representation and manipulation, database management systems, design of database and information systems. Prerequisites: ACC 500; CIS 335, 500.

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; 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 500 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 505 or equivalent.

530 Information Systems Development. (3) A
Evaluation of languages and quality assurance techniques for system implementation and maintenance. Prerequisite: CIS 505.

535 Distributed Information Systems. (3) A
Introduction to networking and its impact on information systems in business. Prerequisite: CIS 440 or 515 or ACC 587.

541 Business Database Systems. (3) A
Comparative analysis of hierarchical, network and relational systems. Theory of information storage and retrieval and design of business information structures. Prerequisites: CIS 505 or equivalent; MAT 210, QBA 501.

551 Decision Support Systems. (3) A
Definition, description and evaluation of decision support systems; structure and application of selected DSS languages. Prerequisite: MAT 210; QBA 501.

591 Seminar in Selected Computer Information Systems Topics. (3) A

593 Applied Project. (3) F, S

791 Doctoral Seminar in Computer Information Systems. (3) A

Special Courses: CIS 394, 484, 492, 493, 494, 497, 498, 499, 500, 590, 592, 598, 599, 690, 691, 692, 700, 790, 791, 792, 799. (See pages 36-37.)

QUANTITATIVE BUSINESS ANALYSIS

QBA 221 Statistical Analysis. (3) F, S
Methods of statistical description. Application of probability theory and statistical inference in business. Prerequisites: MAT 119, 210. *[Satisfies General Studies Requirement: N2]*

222 Introduction to Management Science. 3) N
Introduction to quantitative models and their application to the analysis of managerial problems in the functional areas of business. Prerequisites: MAT 210; QBA 221. Pre- or corequisite: ACC 211. *[Satisfies General Studies Requirement: N2]*

321 Intermediate Business Statistics. (3) A
Application of regression and analysis of variance models to business and economic problems. Prerequisites: QBA 221 or equivalent; professional program business student.

391 Intermediate Management Science. (3) A
Study of mathematical models and solution techniques which can be used to aid decision makers. Prerequisites: MAT 119, 210, 242; QBA 221; professional program business student.

405 Sampling Techniques in Business. (3) A
Planning, execution and analysis of surveys in business research. Prerequisites: QBA 221 or equivalent; professional program business student.

410 Applied Business Forecasting. (3) A
Application of forecasting techniques in business and institutional environments. Prerequisites: QBA 321; professional program business student.

421 Advanced Business Statistics. (3) N
Applications of probability and statistical inference to business decisions. Probability theory, decision theory and Bayesian inference. Prerequisites: MAT 270; QBA 221; professional program business student.

450 Decision Analysis Applications. (3) N
Implementation of quantitative techniques for the analysis and solution of managerial problems. Prerequisites: QBA 391, 405, 410; professional program business student.

500 Fundamentals of Business Statistics. (3) F, S
Basic statistical measures. Probability concepts and statistical inference. Prerequisite: MAT 210.

501 Managerial Statistics. (3) F, S
Statistical methods used in decision making including analysis of variance, multiple regression, time series, decision theory and non-parametric statistics. Prerequisites: MAT 210; QBA 500.

503 Management Science. (3) F, S
Quantitative approaches to decision making, including linear programming and simulation, with an emphasis on business applications. Prerequisites: MAT 210; QBA 500.

524 Nonparametric Statistics. (3) N
Nonparametric statistical tests for location, dispersion, trend, association, correlation and goodness-of-fit. Nonmetric scaling techniques. Prerequisites: MAT 210, QBA 501.

525 Applied Regression Models. (3) F, S
Simple linear regression, multiple regression, indicator variables and logistic regression. Emphasis on business and economic applications. Prerequisites: MAT 210; QBA 501.

527 Categorical Data Analysis. (3) A
Discrete data analysis in business research. Multidimensional contingency tables and other discrete models. Prerequisite: QBA 525.

528 Exploratory Data Analysis. (3) A
Introduces student to principles and methods of exploratory data analysis. Prerequisite: QBA 501.

530 Experimental Design. (3) A
Experimental designs used in business research. Balanced and unbalanced factorial designs, repeated measures designs and multivariate analysis of variance. Prerequisite: QBA 525 or equivalent.

535 Multivariate Methods. (3) A
Advanced statistical methods used in business research. Multivariate analysis of association and interdependence. Prerequisite: QBA 525.

540 Forecasting. (3) A
Foundation of statistical forecasts and forecast intervals; application of classical and computer-assisted forecasting methods to business forecasting problems. Prerequisites: MAT 210; QBA 501.

550 Decision Analysis. (3) A
Quantitative decision analysis methods for business decision making under uncertainty, including decision diagrams, subjective probabilities and preference assessment. Prerequisites: MAT 210; QBA 501.

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: MAT 210; QBA 501.

560 Probabilistic Models. (3) A
Development and application of probabilistic models for quantitative business analysis. Prerequisites: MAT 210; QBA 501.

561 Mathematical Programming. (3) A
Techniques for solving mathematical programming models of business problems. Prerequisites: MAT 210, 242.

562 Network Flow Models. (3) A
Introduction to network structure, applications and algorithms; development of data structures for network algorithms applied to business problems. Prerequisite: QBA 561; or MAT 242 and QBA 503.

564 Nonlinear Optimization. (3) A
Basic properties of solutions and algorithms for constrained and unconstrained minimization, basic descent methods and barrier methods. Prerequisite: QBA 561; or MAT 242 and QBA 503.

591 Seminar. (3) A

593 Applied Project. (3) F, S

791 Doctoral Seminar in Quantitative Business Analysis. (3) A

Special Courses: QBA 499. (See pages 36-37.)

Economics

PROFESSORS:
BOYES (BAC 651), BRADA, BURGESS, COCHRAN, FAITH, GOODING, HOGAN, JACKSON, KAUFMAN, KINGSTON, KNOX, LADMAN, McPHETERS, SCHLAGENHAUF

ASSOCIATE PROFESSORS:
BLAKEMORE, COX, DeSERPA, HAPPEL, HOFFMAN, LOW, McDOWELL, MELVIN, MENDEZ, ORMISTON, SMITH, WINKELMAN

ASSISTANT PROFESSORS:
FINN, WRASE

LECTURER:
ROBERTS

PROFESSORS EMERITI:
LOWE, PLANTZ

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 also 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.

Economics majors are required to take MAT 270, Calculus with Analytic Geometry I and earn a minimum grade of "C" before taking upper-division courses in economics.

The major in Economics shall consist of 18 semester hours of upper-division courses in economics. The following 6 hours must be included:

			Semester Hours
ECN	313	Intermediate Macroeconomic Theory	3
ECN	314	Intermediate Microeconomic Theory	3

ECN 313 and ECN 314 are required. They must be taken after the completion of MAT 270 and prior to other upper-division courses in economics. Concurrent enrollment in ECN 313 and ECN 314 is permitted. Concurrent enrollment with one of the above and other upper-division courses in economics is subject to approval of the faculty advisor.

ECONOMICS

ECN 111 Macroeconomic Principles. (3) F, S, SS
Basic macroeconomic analysis. Economic institutions and factors determining income levels, price levels and employment levels. *[Satisfies General Studies Requirement: SB]*

112 Microeconomic Principles. (3) F, S, SS
Basic microeconomic analysis. Theory of exchange and production, including the theory of the firm. *[Satisfies General Studies Requirement: SB]*

313 Intermediate Macroeconomic Theory. (3) F, S, SS
Determinants of aggregate levels of employment, output and income of an economy. Prerequisites: ECN 111, 112; MAT 270 (grade of "C" or higher). *[Satisfies General Studies Requirement: SB]*

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, 112; MAT 270 (grade of "C" or higher). *[Satisfies General Studies Requirement: SB]*

315 Money and Banking. (3) F, S
Functions of money. Monetary systems, credit functions, banking practices and central banking policy. Prerequisite: ECN 111. *[Satisfies General Studies Requirement: SB]*

321 Labor Economics. (3) A
Origins of labor movement, analysis of labor unions, labor markets, collective bargaining and current policy issues. Prerequisite: ECN 314. *[Satisfies General Studies Requirement: SB]*

331 Comparative Economic Systems. (3) A
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. *[Satisfies General Studies Requirements: SB, G]*

341 Public Finance. (3) A
Public goods, externalities, voting models, public expenditures, taxation and budget formation with emphasis on the federal government. Prerequisite: ECN 314. *[Satisfies General Studies Requirement: SB]*

360 Economic Development. (3) A
Theories of economic growth and development. Role of capital formation, technological innovation, population and resource development in economic growth. Prerequisites: ECN 111, 112. *[Satisfies General Studies Requirements: SB, G]*

365 Economics of the Soviet Union and Eastern Europe. (3) A
Origins and analysis of contemporary institutions. Comparative development and differentiation in the 20th century. Prerequisites: ECN 111, 112. *[Satisfies General Studies Requirements: SB, G]*

404 History of Economic Thought. (3) A
Development of economic doctrines, theories of mercantilism, physiocracy, classicism, neoclassicism, Marxism and contemporary economics. Prerequisites: ECN 313, 314. *[Satisfies General Studies Requirement: SB]*

436 International Trade Theory. (3) A
The comparative-advantage doctrine, including practices under varying commercial policy approaches. The economic impact of international disequilibrium. Prerequisites: ECN 313, 314. *[Satisfies General Studies Requirements: SB, G]*

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. Prerequisites: ECN 313, 314. *[Satisfies General Studies Requirements: SB, G]*

453 Government and Business. (3) A
Development of public policies toward business. Antitrust activity. Economic effects of government policies. Prerequisite: ECN 314. *[Satisfies General Studies Requirement: SB]*

480 Introduction to Econometrics. (3) A
Elements of regression analysis: estimation, hypothesis tests, prediction. Emphasis is on use of econometric results in assessment of economic theories. Prerequisite: ECN 314.*[Satisfies General Studies Requirement: N2]*

484 Economics Internship. (3) F, S, SS
Academic credit for professional work organized through the Internship Program. Prerequisites: ECN 313, 314; outstanding academic record.

485 Mathematical Economics. (3) A
Integration of economic analysis and mathematical methods into a comprehensive body of knowledge within contemporary economic theory. Prerequisites: ECN 313, 314. *[Satisfies General Studies Requirement: N2]*

498 Pro-Seminar. (3) A
Chosen from selected topics, e.g., money, development, urban economics, economic regulation, area studies, etc. Prerequisites: ECN 313, 314.

500 Fundamentals of Economic Analysis. (3) F, S
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
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 preclassical economics through Keynes.

509 Macroeconomic Theory and Applications. (3) A
Theory of income, output, employment and price level. Influence on business and economic environment. Prerequisite: ECN 111.

510 Microeconomic Theory and Applications. (3) A
Theory of exchange, production and pricing in a market economy. Influence on business and economic environment. Prerequisite: ECN 112.

511 Macroeconomic Analysis I. (3) A
The nation's income, output, employment and general price level. Examination of current theoretical and empirical research and policy problems. Prerequisite: ECN 313.

512 Microeconomic Analysis I. (3) A
Theory of exchange, production, resource use and pricing in capitalistic and mixed systems. Prerequisite: ECN 314.

513 Macroeconomic Analysis II. (3) A
Advanced topics in macroeconomics. Emphasis on applied macroeconomic models. Prerequisite: ECN 511.

514 Microeconomic Analysis II. (3) A
Advanced topics in microeconomics. Emphasis on general equilibrium, welfare economics and production and capital theory. Prerequisite: ECN 512.

516 Monetary Theory. (3) N
Traditional and post-Keynesian monetary theory, interest rate determination, the demand and supply of money. Prerequisite: ECN 511.

517 Monetary Policy. (3) N
Determinants of the money supply and interest rate levels. Federal Reserve policy and its effectiveness. Prerequisite: ECN 516.

521 Labor Economics I. (3) N
Development of basic theoretical models for analyzing labor market issues. Prerequisite: ECN 512.

522 Labor Economics II. (3) N
Extensions/criticisms of labor market theories. Applications to a variety of policy issues. Prerequisite: ECN 521.

531 Economic Systems and Organizations. (3) N
Philosophical foundations of major economic systems and of properties of principal system models. Comparison of alternative institutions and system components of contemporary economies. Prerequisites: ECN 511, 512.

536 International Trade 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. Prerequisites: ECN 511, 512.

538 International Monetary Theory and Policy. (3) A
The foreign exchange market, balance of payments, and international financial institutions and arrangements; theory and applications. Prerequisites: ECN 511, 512.

543 Public Sector Economics. (3) N
Economics of collective action, public spending and taxation. Impact of central governmental activity on resource allocation and income distribution. Prerequisite: ECN 512.

553 Industrial Organization. (3) N
Analysis of structure, conduct and performance in industrial markets and recent developments in antitrust policies. Prerequisite: ECN 512.

561 Economics of Developing Nations. (3) N
Economic problems, issues and policy decisions facing the lesser-developed nations of the world. Prerequisites: ECN 511, 512.

572 Regional Economics. (3) N
Introduction to export-base, input-output, linear programming, simulation and econometric modeling as tools of regional analysis. Prerequisite: ECN 512.

573 Urban Economics. (3) N
Models of urban growth and intra-urban location, the urban public sector and cost-benefit analysis as a tool of urban analysis. Prerequisite: ECN 512.

580 Econometrics I. (3) A
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) A
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. Prerequisites: ECN 511, 512.

591 Seminar in Selected Economics Topics. (3) N

594 Conference and Workshop in Economics. (1-2) F, S
Working papers by department faculty and outside speakers are presented and discussed. Economics ABDs will also present their thesis proposal. Prerequisite: instructor approval.

791 Doctoral Seminar in Economics. (3) A

Special Courses: ECN 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 594, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 36-37.)

Finance

PROFESSORS:
GUNTERMANN, JOEHNK, KRAFT, NELSON, POE, SUSHKA
ASSOCIATE PROFESSORS:
SMITH (BA 352), BOOTH, BUTLER, CESTA, DAVIS, HOFFMEISTER, MARTIN, MYLER, WILT
ASSISTANT PROFESSORS:
GALLINGER, HERTZEL, PRISMAN
PROFESSORS EMERITI:
ANDERSON, DAUTEN, STEVENSON, TENNEY

The study of finance prepares students to understand the financial implications inherent in virtually all business decisions. Students majoring in Finance are prepared for entry-level careers in corporate management, depository institutions, investment management or financial services. The Finance curriculum emphasizes financial markets, evaluation of investments and efficient allocation of resources.

The major in Finance consists of 18 semester hours. All students must complete ACC 321, Intermediate Accounting, before taking 400-level finance courses. The following courses must be included in the major:

			Semester Hours
FIN	331	Financial Markets and Institutions	3
FIN	361	Managerial Finance	3
FIN	421	Security Analysis and Portfolio Management	3

To complete the major, the student must:

1. Select two additional 400-level finance courses designated in the *Catalog* with the prefix FIN, and
2. Select one additional upper-division course approved by the Department of Finance faculty. This course may be, but is not restricted to, an additional finance course or ACC 321. Students have the option of including ACC 321 as part of the major or as a free elective to satisfy the semester-hour requirements for the baccalaureate degree.

Real Estate

The Real Estate program is designed for students with a professional interest in real estate. Academic preparation can lead to careers in land development, investment analysis and counseling, appraisal, property management, sales and finance.

The Real Estate major consists of a minimum of 18 semester hours with at least 15 hours in real estate courses. GNB 411 and REA 300 must be completed before taking other real estate courses. REA 251 is not open to Real Estate majors.

The following 12 hours must be included:

			Semester Hours
GNB	411	Real Estate Law	3
REA	300	Real Estate Analysis	3
REA	331	Real Estate Finance	3
REA	401	Real Estate Appraisal	3

To complete the major, the student must select one of the following:

REA	441	Real Estate Land Development
REA	456	Real Estate Investments
REA	461	Current Real Estate Topics

and one additional upper-division course approved by the Department of Finance faculty.

FINANCE

FIN 251 Principles of Personal Investments. (3) F, S
Investment concepts for individual investors, fundamentals of investment techniques and principles of sound investment. For non-majors. Course may be used only for elective credit by College of Business students.

300 Fundamentals of Finance. (3) F, S, SS
Theory and problems in financial management of business enterprises. Prerequisites: ACC 212; ECN 112; QBA 221.

331 Financial Markets and Institutions. (3) F, S
Analysis of financial markets and intermediaries. Theory of financial intermediation, interest rate theory, money and capital market instruments, government regulation. Prerequisites: FIN 300; professional program business student.

361 Managerial Finance. (3) F, S
Theories and problems in resource allocation, cost of capital, CAPM and capital budgeting, asset valuation, capital structure and financing policy. Prerequisite: FIN 300.

421 Security Analysis and Portfolio Management. (3) F, S
Security analysis theory and practice. Selection and management of financial asset portfolios. Securities markets and portfolio risk-return analysis. Prerequisites: ACC 321; FIN 331, 361; professional program business student.

427 Speculative Securities. (3) A
Study of stock options, index options, convertible securities, financial futures, warrants, subscription rights, arbitrage pricing theory. Prerequisites: FIN 421; professional program business student.

431 Management of Financial Institutions. (3) A
Asset/liability and capital management in financial institutions. Influence of market factors and regulatory agencies. Emphasis on commercial banks. Prerequisites: ACC 321; FIN 331; professional program business student.

441 Financial Planning. (3) A
Integrates finance, insurance, real estate, investments, taxation and law into the life-cycle financial planning process. Prerequisites: ACC 321; FIN 300; professional program business student.

451 Working Capital Management. (3) A
Analysis of short-term profitability and liquidity. Emphasis on managing cash, accounts receivable, inventory and current liabilities. Prerequisites: ACC 321; FIN 300; professional program business student.

461 Financial Cases and Modeling. (3) A
Case-oriented capstone course in managerial finance. Contemporary issues of liquidity management, capital budgeting, capital structure and financial strategy. Prerequisites: 12 hours of upper-division FIN courses; professional program business student.

500 Finance Fundamentals. (3) F, S
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
Current theoretical developments and techniques in financial decision making; including valuation, working capital, financial structure, resource allocation, international. Prerequisite: FIN 500 or equivalent.

521 Investment Management. (3) A
Valuation of equities, fixed incomes and options/financial futures in an individual security and portfolio context; mathematical asset allocation approaches. Not open to students with credit in FIN 421. Prerequisite: FIN 500.

531 Capital Markets and Institutions. (3) A
Recent theoretical and operational developments in economic sectors affecting capital markets and institutions. Not open to students with credit in FIN 431. Prerequisite: FIN 500.

561 Financial Management Cases. (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: ACC 501; FIN 500.

581 Theory of Financial Decisions. (3) A
Theories and applications of managerial finance and investments. Capital budgeting, capital structure, dividend theory and valuation. Prerequisites: ECN 500; FIN 500; QBA 501.

791 Doctoral Seminar in Finance. (3)
(a) Investments. F'88
Investments and market theory; efficient markets hypothesis; option and commodity markets. Prerequisite: FIN 581.
(b) Financial Institutions and Markets. S'89
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'89
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 36-37.)

INSURANCE

INS 251 Principles of Insurance. (3) N
Coverages available, buying methods, regulation, claims, insurance institutions, career opportunities.

321 Life and Health Insurance. (3) N
Types and uses of life and health policies, industry organization, regulations, underwriting and other company operations. Prerequisite: professional program business student.

331 Property Insurance Principles and Coverage. (3) N
Principles of property and liability insurance, industry organization, types and forms of coverages and commercial coverage fundamentals. Prerequisite: INS 251 or instructor approval; professional program business student.

461 Estate Planning. (3) N
Use of life insurance with wills, trusts and buy-sell agreements, tax aspects. Needs approach to estate planning. Prerequisite: professional program business student.

481 Risk Management, Theory and Practice. (3) N
Identification, measurement and treatment of business risk from viewpoint of management. Emphasizes control, retention and insuring of commercial risks. Prerequisite: 3 hours of insurance or instructor approval; professional program business student.

Special Courses: INS 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 36-37.)

REAL ESTATE

REA 251 Real Estate Principles. (3) A
Regulation, practices, legal aspects and professional opportunities of the real estate industry. Cannot be applied to real estate major.

300 Real Estate Analysis. (3) A
Application of economic theory and analytical techniques to real estate markets. Topics include law, finance, appraisal, market analysis, investments, development. Prerequisite: professional program business student.

331 Real Estate Finance. (3) A
Legal, market and institutional factors related to financing proposed and existing properties. Emphasis on current financing techniques and quantitative methods. Prerequisites: FIN 300; professional program business student.

401 Real Estate Appraisal. (3) A
Factors affecting the value of real estate. Theory and practice of appraising and preparation of the appraisal report. Appraisal techniques. Prerequisites: REA 300; professional program business student.

402 Income Property Appraisal. (3) A
Valuation of net income streams for various types of income producing properties. Prerequisites: REA 401; professional program business students.

441 Real Estate Land Development. (3) A
Neighborhood and city growth. Municipal planning and zoning. Development of residential, commercial, industrial and special purpose properties. Prerequisites: REA 300; professional program business student.

456 Real Estate Investments. (3) A
Analysis of investment decisions for various property types. Cash flow and rate of return analysis. Prerequisites: FIN 300; professional program business student.

461 Current Real Estate Topics. (3) N
Current real estate topics of interest are discussed and analyzed. Prerequisites: REA 300; professional program business student.

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 36-37.)

General Business

PROFESSORS:
BOGGS (BA 319), GRYDER, HENNINGTON, JENNINGS
ASSOCIATE PROFESSORS:
ARANDA, BOHLMAN, DUNDAS, GARCIA, GILSDORF, GOLEN, HUTT, KELLER, LEONARD, LOCK, LYNCH, MURRANKA, OLIVAS, OLNEY, RADER, SMELTZER, A. SMITH, VAN HOOK, WILSON
ASSISTANT PROFESSORS:
FANN, HURSTON, REISS
SENIOR LECTURER:
WRIGHT
PROFESSORS EMERITI:
BATY, JACKS, LEWIS, C. SMITH, TATE

Offering the opportunity for a General Business degree 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 9 semester hours must be included in the student's program:

			Semester Hours
ACC	301	Management Uses of Accounting	3
FIN	331	Financial Markets and Institutions	3
MKT	302	Fundamentals of Marketing Management	3

In addition students must select two of the following four courses:

			Semester Hours
GNB	320	Entrepreneurship	3
GNB	451	Business Research Methods	3
MGT	352	Human Behavior in Organizations	3
OPM	331	Production and Operations Management	3

The remaining three hours will be upper-division business courses selected in consultation with a general business faculty advisor.

Business Teaching

This area prepares students who desire to teach business subjects in secondary schools. A student seeking a major in Business Teaching would complete the General Business area of specialization as well as any current state requirements for certifica-

tion. A teaching minor is also available, consisting of 24 semester hours in business. Interested students should contact the business teaching advisor in the Department of General Business.

The Department of General Business participates in programs leading to the degrees of Master of Education; Doctor of Education; and Doctor of Philosophy, Curriculum and Instruction. Consult the *Graduate Catalog* for requirements.

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, technological and ethical considerations. *[Satisfies General Studies Requirement: SB]*

233 Business Communication. (3) F, S, SS
Written and oral reporting. Organization, analysis and presentation of business information, using electronic and other media. Prerequisites: ENG 102 and at least sophomore standing. *[Satisfies General Studies Requirement: L1]*

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, SS
Opportunities, risks and problems associated with small business development and operation.

351 Administrative Office Management. (3) A
Principles and procedures of office management and information resources management in the organization.

401 Small Business Administration. (3) A
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.

411 Real Estate Law. (3) A
Legal practices as applied to the real estate field and to the fields of titles, mortgages, lending and trust work.

412 Insurance Law. (3) N
Legal concepts and doctrines applicable to the field of insurance. Prerequisite: 6 hours of insurance; professional program business student.

420 Venture Design and Development. (3) A
Analysis, design and development of a business plan for a new venture. Prerequisite: ACC 212.

431 Business Report Writing. (3) A
Organization and preparation of reports incorporating electronic data bases, word processing and graphics. Prerequisite: GNB 233.

432 Office Automation. (3) A
Organization and management of automated administrative systems.

451 Business Research Methods. (3) F, S
Methods of collecting information pertinent to business problem solving including design, collection, analysis, interpretation and presentation of primary and secondary data.

461 Theory of Administrative Communication. (3) A
Intrapersonal, interpersonal and administrative communication.

480 Teaching Business Subjects. (3) N
Organization and presentation of appropriate content for business subjects in the secondary school.

491 Organization and Management of Cooperative Programs. (3) N
Work-study programs for business occupations in high schools and community colleges.

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 GNB 305 or equivalent.

501 Executive Communication. (3) F, S, SS
Analysis of various business problems, situations and development of appropriate communication strategies.

502 Principles of Business Education. (3) N
History, philosophy, principles and objectives of business education.

503 Tests and Measurements in Business Education. (3) N
Construction, administration and evaluation of tests in business subjects.

504 Professional Report Writing. (3) A
Preparation and presentation of professional reports.

505 Current Literature in Business Education. (3) N
Critical analyses, generalizations and trends.

506 Information Processing for Business Teachers. (3) N
Development of curriculum, lesson plans and strategies for teaching information processing; hardware/software evaluations and equipment acquisition techniques.

507 Business Research Methods. (3) A
Techniques for gathering information for business decision making. Selection, design and completion of a business-oriented research project.

511 Instructional Development in Business Education. (3) N
Emerging curricula and instructional strategies in business education.

515 Observation and Work Experience. (3) N
Observation and/or participation in business.

591 Seminar. (3) N
Topics such as the following will be offered:
(a) Selected Business Communication Topics
(b) Selected Business Law Topics
(c) Selected Entrepreneurial Topics
(d) Selected Business Teaching Topics

594 Study Conference or Workshop. (3) N

700 Research Methods. (3) N

791 Doctoral Seminar in Business Education. (3) N

Special Courses: GNB 394, 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 594, 598, 599, 690, 692, 700, 790, 791, 792, 799. (See pages 36-37.)

School of Health Administration and Policy

PROFESSORS:
SCHNELLER (BA 252), BOISSONEAU
ASSOCIATE PROFESSORS:
KIRKMAN-LIFF, WILLIAMS
ASSISTANT PROFESSORS:
HUGHES, OHSFELDT

The Graduate Program in Health Services Administration

The School of Health Administration and Policy offers the Master of Health Services Administration (M.H.S.A.). Students enrolled in the school may earn the concurrent M.H.S.A./M.B.A. degrees. The school also collaborates with the College of Law to allow students to earn, concurrently, the M.H.S.A./J.D. degrees.

The M.H.S.A. program is designed to prepare students for entry-level management positions in health services delivery, planning/policy and consulting organizations. Although the largest proportion of program graduates have aspired to and successfully received employment in hospitals, the curriculum and research efforts within the school do not focus on one categorical setting. Students are able to study the characteristics of vertically integrated systems, long-term care and other components of the continually evolving health care system. Since so many of the features of the environment of health services are subject to periodic change (e.g., reimbursement and informations systems), substantial emphasis is on building the basic skills and analytic perspectives necessary to encounter and react to change through innovation and action.

The program has a special commitment to provide students with an understanding of the competitive nature of the health care system. Since so many of the features of the environment of health services are subject to periodic change, substantial emphasis is placed on building basic skills to understand and scan environments and encounter and react to change through innovative action. Program students are educated to think independently, and to recognize the strengths and weaknesses of group processes in decision making.

To accomplish its mission to establish a pattern for skill acquisition, ideology and style necessary for entry into the job marketplace and mobility to careers as chief executive officers in target organizations, the curriculum provides students with: (1) understanding, analysis and application, which are essential for effective health care administration, (2) internship, residency and project experiences for sharpening skills and bridging the gap between academics and practice, and (3) opportunities to interact with practitioners in the classroom as well as in other structured field relationships.

HEALTH ADMINISTRATION AND POLICY

HSA 494 Special Topics in Health Administration. (3) A
Seminar topics, including comparative health care systems, ambulatory care administration, behavioral health, long term care and health economics. Prerequisite: instructor approval.

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) A
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) A
Functional relationships among managerial elements of health care institutions with major focus on hospital governance and policy dynamics. Prerequisite: HSA 501.

522 Health Care Management Systems. (3) A
Systems concepts, quantitative methods and information systems applied to management problems in health institutions and community health planning. Prerequisites: HSA 501, 504; QBA 501.

532 Financial Management of Health Services. (3) A
Acquisition, allocation and management of financial resources within the health care enterprise. Budgeting, cost analysis, financial planning and internal controls. Prerequisites: ACC 501; HSA 501.

542 Health Care Jurisprudence. (3) A
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.

571 Ambulatory Care Management. (3) A
The evolution, planning and management of multi-specialty group practices, health maintenance organizations and other alternative delivery systems.

589 Integrative Seminar. (3) A
Capstone assessment of current policies, problems and controversies across the broad spectrum of health services administration. Prerequisites: HSA 501, 504, 520.

591 Seminar. (3) A
Seminar topics such as the following may be offered:
(a) Comparative health care systems
(b) Cost containment and quality assurance
(c) Behavioral health
(d) Long term care
(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. Minimum of 10 weeks. Prerequisites: 18 hours of credit toward program of study; director approval.

Special Courses: HSA 590, 591, 592, 593, 598, 599. (See pages 36-37.)

International Business Studies

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 major.

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	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 an international business faculty advisor as early as possible.

INTERNATIONAL BUSINESS STUDIES

IBS 300 Principles of International Business. (3) A Multidisciplinary analysis of international economic and financial environment. Operations of multi-national firms and their interaction with home and host societies. Prerequisite: ECN 112. *[Satisfies General Studies Requirement: G]*

IBS 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:
PENLEY (BA 367E), BASKIN (ASU WEST CAMPUS), BOHLANDER, GROSSMAN, KREITNER, MONTANARI, PASTIN, REIF, SCHABACKER (ASU WEST CAMPUS), WHITE

ASSOCIATE PROFESSORS:
BASSFORD, BRENENSTUHL, COOK, HOM, MOORHEAD, SHIPPER

ASSISTANT PROFESSORS:
CARSON, DAVY, EDER (ASU WEST CAMPUS), HARRISON, KINICKI, MALEKZAHEH (ASU WEST CAMPUS)

PROFESSORS EMERITI:
COCHRAN, DAVIS, HEIER, INSKEEP

Management includes the functions of planning, organizing, staffing, motivating and controlling in the business setting; yet management is more than mere administration. Good managers make things happen through their actions within the organization and through responsible contributions to society. Good managers also understand the implications of their actions in an international environment. The Department of Management offers international business seminars for its students and it provides students the opportunity to specialize their studies in management systems or human resources management.

Management Systems

The purpose of management is to maximize desirable organizational outputs and minimize undesirable organizational outputs given realistic constraints. Many tools and systems are used to achieve these ends. These tools and systems are the focus of the management systems track. The following courses must be taken to complete this track:

		Semester Hours
MGT 311	Personnel Management	3
MGT 352	Human Behavior in Organizations	3

Three of the following four courses:

MGT 433	Management Decision Analysis	3
MGT 434	Social Responsibility of Management	3
MGT 459	International Management	3
MGT 468	Management Systems	3

In addition, students must take one MGT elective approved by a management advisor.

All Management majors are required to take 6 upper-division hours selected from the College of Business *Policy Statement 63* and approved by a management advisor.

Human Resource Management

Effective organizational management depends upon creating an internal organization which is designed to accomplish the organizational mission. The human resource management track introduces the student to issues surrounding the human component of organizations. The curriculum encompasses planning, staffing, motivating, training and development, compensation, performance appraisal, labor relations and labor law. The courses are designed to provide knowledge and skills that will allow HRM graduates to function as personnel specialists. The following courses must be taken to complete the human resource management track:

		Semester Hours
MGT 311	Personnel Management	3
MGT 352	Human Behavior in Organizations	3
MGT 413	Wage and Salary Management	3
MGT 423	Industrial Relations and Collective Bargaining	3

In addition, students must take two MGT electives in human resource management approved by a management advisor.

All Management majors are required to take 6 upper-division hours selected from the College of Business *Policy Statement 63* and approved by a management advisor.

MANAGEMENT

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.

311 Personnel Management. (3) A
Manpower planning, staffing, training and development, compensation, appraisal and labor relations. Prerequisite: MGT 301.

352 Human Behavior in Organizations. (3) A
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) A
Installation and administration of a complete wage and salary program. Includes objectives, policies, organization, control, job evaluation and wage surveys. Prerequisites: MGT 311; professional program business student.

422 Training and Development. (3) A
Learning theory, orientation and basic level training, management development, resource materials and methods. Prerequisites: MGT 311; professional program business student.

423 Industrial Relations and Collective Bargaining. (3) A
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. Prerequisites: MGT 301; professional program business student.

434 Social Responsibility of Management. (3) A
Relationship of business to the social system and its environment. Criteria for appraising management decisions. Managers as change agents. Prerequisites: MGT 301; professional program business student.

452 Organizational Behavior Applications. (3) A
The complex set of behavioral forces and relationships that influence organizational effectiveness. Intervention strategies and application skills. Prerequisites: MGT 352; professional program business student.

459 International Management. (3) A
Concepts and practices of multinational and foreign firms. Objectives, strategies, policies and organizational structures for operating in various environments. Prerequisite: MGT 301.

463 Strategic Management. (3) F, S, SS
Strategic formulation and administration of the total organization, including integrative analysis and strategic planning. Recommended for last semester of senior year. Prerequisites: completion of 96 hours, including all other Business Administration core requirements; professional program business student. *[Satisfies General Studies Requirement: L2]*

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
A survey of managerial functions and roles with emphasis on strategic management, planning, organizing, staffing and control. Not open to students who have earned credit in MGT 301 or equivalent.

501 Managerial Concepts. (3) F, S
Important concepts and applications in management including motivation, leadership, group dynamics, organization design, decision-making, communication and organization change. Prerequisite: MGT 301 or 500.

503 Complex Organizations. (3) A
Concepts and applications in macro organization theory. Topics include organization structure, strategic choice, culture, boundary spanning, effectiveness and different perspectives of interorganizational relations.

520 Problems in Personnel Management. (3) A
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) A
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) A
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
Formulation of strategy and policy in the organization, emphasizing the integration of decisions in the functional areas. Prerequisites: ACC 501; ECN 501; FIN 501; MGT 501; MKT 501; QBA 501.

591 Seminar. (3) A
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) A

Special Courses: MGT 484, 492, 493, 494, 497, 498, 499, 584, 590, 592, 593, 598, 599, 690, 692, 700, 792, 799. (See pages 36-37.)

Marketing

PROFESSORS:
B. J. WALKER (BAC 471), BROWN, GWINNER, JACKSON, OSTROM, REINGEN, ROWE, SCHLACTER

ASSOCIATE PROFESSORS:
BELTRAMINI, BLASKO, CROSBY, EVANS, GOURLEY, HUTT, MOKWA, STEPHENS, SWARTZ

ASSISTANT PROFESSORS:
BITNER, CHO, CROSS, GILL, KALE, KLEINE, MARINE, SINHA, B. WALKER, WARD

PROFESSORS EMERITI:
BESSOM, DOWNING, HARRIS, OVERMAN, SCHMIDT, ZACHER

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 18 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, students, in consultation with their faculty advisors, shall select 6 additional hours from among the following list of courses:

			Semester Hours
ADV	301	Advertising Principles	3
ADV	311	Advertising Creative Strategy	3
ADV	371	Advertising Media	3
ADV	461	Advertising Management	3
MKT	310	Principles of Selling	3
MKT	321	Principles of Retailing	3
MKT	325	Public Relations in Business	3
MKT	411	Sales Management	3
MKT	412	Marketing Communications	3
MKT	424	Retailing Management	3
MKT	434	Industrial Marketing	3
MKT	435	International Marketing	3
MKT	444	Marketing Channels	3

Note: Students may not receive credit for both ADV 301 and MKT 412.

In addition, all Marketing majors are required to take a three-hour communications course and a three-hour behavioral science course from among a list of General Studies courses approved by the Department of Marketing. The list of approved courses is contained in the *Marketing Field of Specialization Student Curriculum Guide*, a copy of which can be obtained from the departmental office.

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. (3) F, S
Application of communication theory to advertising. Evaluation of strategies and executions. Creation of a portfolio containing print and broadcast advertisements. Prerequisite: ADV 301; non-business majors must obtain department approval.

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.

461 Advertising Management. (3) A
A capstone course in advertising dealing with the management of advertising from both the client and agency perspectives. Prerequisites: ADV 311, 371; MKT 351.

Special Courses: ADV 484, 492, 493, 494, 497, 498, 499, 590, 592, 593, 598, 599. (See pages 36-37.)

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. Prerequisites: MKT 300; 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) A
The communication process as it relates to the promotional activities of the firm from a strategic point of view. Not open to students with credit in ADV 301. 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 or instructor approval.

435 International Marketing. (3) A
Analysis of marketing strategies developed by international firms to enter foreign markets and to adapt to changing international environments. Prerequisite: MKT 302 or instructor approval; professional program business student.

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; professional program business student.

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. Prerequisites: MKT 302, 304, 351; professional program business student.

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 300 or 500.

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 instructor approval.

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) A
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

(f) Services Marketing
(g) Advertising Strategy

791 Doctoral Seminar in Marketing. (3) F, S

Special Courses: MKT 484, 492, 493, 494, 497, 498, 499, 584, 590, 592, 593, 598, 599, 690, 692, 700, 790, 792, 799. (See pages 36-37.)

Purchasing, Transportation, Operations

PROFESSORS:
RUCH (BA 323), FARRIS, FEARON, HENDRICK, SHROCK, VELLENGA
ASSOCIATE PROFESSORS:
CALLARMAN, DANIEL, PEARSON
ASSISTANT PROFESSORS:
GRITZMACHER, LANDEROS, D. SMITH-DANIELS, V. SMITH-DANIELS
SENIOR LECTURER:
WIGGINS
PROFESSOR EMERITUS:
REUTER

Operations/Production Management

OPM majors study the planning and control of internal operations of manufacturing and service businesses. Topics covered include job design, facilities location and layout, work measurement, production planning and scheduling, quality control, inventory control, materials management, purchasing and transportation. The goal is to design, implement and operate a productive system to produce goods and services in a competitive global economy. OPM majors are prepared for careers in the operations area of large and small firms in a wide variety of industries.

A major in Operations/Production Management consists of the following 18 semester hours:

			Semester Hours
OPM	331	Production and Operations Management	3
PUR	432	Materials Management	3
OPM	435	Service Operations Management	3
OPM	440	Productivity and Quality Management	3
TRA	445	Logistics Systems	3
OPM	475	Operations Strategies	3

Purchasing/Materials Management

The major includes the functions of planning, organizing 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 products, and the disposal of scrap and surplus materials.

A major in Purchasing/Materials Management shall consist of the following 18 semester hours:

			Semester Hours
OPM	331	Production and Operations Management	3
PUR	355	Purchasing	3
TRA	345	Traffic and Distribution Management	3
PUR	432	Materials Management	3
PUR	455	Purchasing Research and Negotiation	3
PUR	479	Purchasing and Materials Management Strategy	3

Transportation

The major in Transportation covers the management of the flow of materials and passengers from both the shipper/receiver and carrier perspective domestically and internationally. Emphasis is on the efficient use of transportation services by business management within a framework of logistics systems, government transportation policy relative to freight and passenger transportation, and the management of transportation shipper and carrier organizations. Students are prepared for employment by industrial firms, carriers and governmental agencies.

A major in Transportation shall consist of the following 18 semester hours:

			Semester Hours
TRA	301	Principles of Transportation	3
TRA	345	Traffic and Distribution Management	3
PUR	355	Purchasing	3
PUR	432	Materials Management	3
TRA	445	Logistics Systems	3
TRA	460	Carrier Management	3

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. Prerequisite: professional program business student.

331 Production and Operations Management. (3) F, S
Use of resources in producing goods and services. Concepts of planning, scheduling and controlling productive activities and physical resources. Prerequisites: OPM 301; professional program business student.

335 Methods Management. (3) A
Theory and practice in work design, methods improvement and work measurement. Relationship of attitudes and productivity. Prerequisites: OPM 301, 331 or instructor approval; professional program business student.

435 Service Operations Management. (3) A
Operations management techniques used in manufacturing and their application in service organizations. Prerequisites: OPM 301, 331 or instructor approval; professional program business student.

440 Productivity and Quality Management. (3) A
Productivity concepts at the national, organizational and individual levels. Quality management and its relationship to productivity in all organizations. Prerequisites: OPM 331 or instructor approval; professional program business student.

470 Production Systems. (3) A
Systems theory and management functions; basic tools of systems analysis; organizational systems design; systems applications; systems simulation. Prerequisites: OPM 331; professional program business student.

475 Operations Strategies. (3) F, S
Integrates operations management into strategic planning, implementation and control. Prerequisites: OPM 331, 435, 440; PUR 432; professional program business student.

581 Management of Production. (3) A
Analysis of the production function from a managerial point of view. Conceptual foundations, analysis of major problems and decision processes.

591 Seminar. (3) N
Topics such as the following will be offered:
(a) Production Systems Research
(b) High-Tech Operations
(c) Operations Strategy
(d) Service Operations
(e) Productivity
(f) Quality

791-A Doctoral Seminar in Production/Operations Management. (3) A

791-B Doctoral Seminar in Logistics Systems. (3) A

Special Courses: OPM 484, 492, 493, 494, 497, 498, 499, 584, 590, 592, 593, 598, 599, 690, 692, 700, 792, 799. (See pages 36-37.)

PURCHASING/MATERIALS MANAGEMENT

PUR 355 Purchasing. (3) F, S,SS
Management of the purchasing function, including organization, procedures, supplier selection, quality, inventory decisions and price determination. Prerequisites: OPM 301; professional program business student.

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: professional program business student.

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 301, 331; PUR 355; professional program business student.

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; PUR 355, 432, 455; TRA 345; professional program business student.

532 Materials and Purchasing Management. (3) A
Analysis of the incoming flow of materials and the economic environment in which the materials acquisition and allocation functions operate.

591 Seminar. (3) N
Topics such as the following will be offered:
(a) Contracting
(b) Systems Acquisitions
(c) Purchasing Research

791 Doctoral Seminar in Purchasing and Materials Management. (3) A

Special Courses: PUR 484, 492, 493, 494, 497, 498, 499, 584, 590, 592, 593, 598, 599, 690, 692, 700, 792, 799. (See pages 36-37.)

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 and Distribution Management. (3) F, S
Managing transportation requirements in business enterprises: analysis of shipper-carrier relationships and the legal environment with respect to rates and services. Prerequisite: professional program business student.

405 Urban Transportation. (3) A
Economic, social, political and business aspects of passenger transportation. Public policy and government aid to urban transportation development. Prerequisite: upper-division standing or instructor approval.

445 Logistics Systems. (3) F, S
Managing the firm's logistics activities: integrating transportation, inventory, warehousing, facility location, customer service and related activities in a systems context. Prerequisite: professional program business student.

460 Carrier Management. (3) F, S
Analysis of carrier economics, regulation, management and rate-making practice; evaluation of public policy issues related to carrier transportation. Prerequisite: professional program business student.

462 Problems in Transportation. (3) A
Current problems of transportation operation, physical distribution and logistics, carrier management and public transportation policy. Prerequisites: TRA 301; professional program business student.

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. Prerequisite: upper-division standing or instructor approval.

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.

791 Doctoral Seminar in Transportation and Physical Distribution Management. (3) A

Special Courses: TRA 484, 492, 493, 494, 497, 498, 499, 584, 590, 592, 593, 598, 599, 690, 692, 700, 792, 799. (See pages 36-37.)

Ginn and Company

College of Education

Gladys Styles Johnston, Ph.D.
Dean

Purpose

For students, choosing a professional college is a major decision. It represents the choice of a profession within which a career will be built. The College of Education provides a stimulating, challenging forum wherein scholars and practitioners interact in the discovery and mastery of the science and art of educational endeavors. This balanced approach, in which research and practice are viewed as essential and complementary, enables the college to produce superior educators.

The purposes of the faculty of the College of Education are (1) the scholarly, scientific and professional study of education, including its problems, structures and processes and (2) the education of students in such study. The College of Education is also dedicated to the design, development, implementation and evaluation of innovative educational programs. In accord with these purposes, the College of Education is committed to producing quality scholarship and research and to excellence in teaching.

Organization

The College of Education is organized into three divisions. These divisions and their academic program areas are listed below:

Division of Curriculum and Instruction
- Adult Education
- Early Childhood Education
- Educational Media and Computers
- Elementary Education
- Multicultural Education
- Reading and Library Science
- Secondary Education
- Special Education

Division of Educational Leadership and Policy Studies
- Educational Administration and Supervision
- Higher Education
- Social and Philosophical Foundations

Division of Psychology in Education
- Counseling
- Counseling Psychology
- Educational Psychology
- Educational Technology

Services to students and the community are provided through two centers. *The Center for Bilingual/Bicultural Education* conducts interdisciplinary research on classroom interaction, language development, and cognitive development. The focus of these research efforts is bilingual and bicultural students in Arizona. *The Center for Indian Education* serves as a service agency to Indian communities, school districts, and Indian students attending Arizona State University. The center also conducts research on Indian education in Arizona and other states with American Indian populations.

In addition to the two centers established by the Board of Regents, other administrative units and college centers provide services to students and the community. These include:

Office of Educational Services. Advises students in preparing their programs of study and assists with all other related matters; places students in school districts for all field experiences in the teacher preparation programs.

Center for Academic Precocity. Provides academic services to intellectually-able students in grades 2-11. These services include individual assessment, talent identification, and a variety of courses.

Counselor Training Center. Counsels members of Arizona State University and the community-at-large for stress, depression, marriage and family problems, career goals, and other personal issues.

Psychological Assessment Laboratory. Provides psychological assessment and consultation services to individuals referred by participating school districts and the university's Disabled Student Services unit.

Special Education Evaluation Clinic. Determines the level of academic competence and areas of remediation in handicapped students referred to the clinic.

Reading Clinic. Diagnoses causes of reading problems and offers one-to-one tutoring by experienced teachers to students referred by parents and recommended by school districts.

Other units with the college offering specialized research and educational services include the Math Clinic; School Personnel, Evaluation and Learning Laboratory; Arizona Educational Information System; University Testing Service; Microcomputer Research Clinic; Mountain States Multifunctional Resource Center; Parent Development International; University Council for Educational Administration; and, the National Center in Postsecondary Governance and Finance–Research Center at ASU.

Degrees

Bachelor of Arts in Education
Master of Arts
Master of Counseling
Master of Education
Education Specialist*
Doctor of Education
Doctor of Philosophy

Undergraduate programs leading to the Bachelor of Arts degree are described below. Descriptions of graduate degree programs can be found in the *Graduate Catalog*.

Bachelor of Arts in Education

Candidates for the Bachelor of Arts in Education degree must complete the Professional Teacher Preparation Program (PTPP) offered by the College of Education. Students completing the program will be able to demonstrate proficiency in specified knowledge areas or skills including:

1. Principles and application of effective instruction;
2. Classroom organization and management;
3. Content or subject matter;
4. Specific curriculum and teaching strategies;
5. Interrelationship of culture and schooling in a multicultural society;
6. Human development;
7. Communication skills;
8. Theories of learning and motivation;
9. Assessment and evaluation;
10. Computer literacy.

Each student in the PTPP selects one of four options which provides specialized instruction and preparation. These program options are (a) Elementary Education, (b) Early Childhood Education, (c) Secondary Education, and (d) Special Education.

The Elementary Education program option prepares students to teach in grades K-8. Students in this option develop the knowledge and skills needed to teach children with a variety of language, cultural and developmental backgrounds. The Early Childhood program option prepares students to work in infant programs and pre-schools, as well as become eligible for certification in grades K-8. The Special Education program option prepares students to teach in special education settings in grades K-12. Students selecting any of the above options must also complete requirements for an academic, Liberal Arts minor and specialization in human development. Careful planning and early advisement in developing an approved program of study is essential for students if they are to complete graduation requirements within the typical 126 semester hour program.

The Secondary Education program option provides preparation for teaching subjects 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 and Sciences, Business, and Engineering and Applied Sciences. Students with teaching majors in the College of Fine Arts will earn the appropriate bachelor's degree from the College of Fine Arts.

Admission

Admission to the PTPP requires that students:

1. Complete a minimum of 56 semester hours of appropriate university course work with a cumulative grade point average of 2.50 or higher;
2. Achieve passing scores on the *Pre-Professional Skills Test (PPST)* which assesses basic skills in reading, writing and mathematics;
3. Submit an application form by deadline dates;
4. Receive approval by the Office of Educational Services that all admissions requirements have been met.

Students are admitted to the PTPP in November of each year for the following spring semester and in April of each year for the following fall semester. Applicants should contact the Office of Educational Services for exact dates which are determined yearly, because the setting of these dates is based on the testing schedules established in Arizona for the PPST.

* Applications are currently not being accepted to the Education Specialist degree program.

Applicants should be aware that PPST scores must be included for an application to be complete and should plan to take the PPST well in advance of application deadlines. In most cases, the PPST can be taken during the sophomore year or immediately after the completion of English and math General Studies requirements.

Admission to the PTPP is highly selective and based on available resources. Not all students who meet minimum requirements will be admitted to the program.

Transfer Students

Transfer students must meet all PTPP admission requirements and should contact the Office of Educational Services for admission procedures and advisement. Students completing their first two years' course work at a community college or four-year institution in Arizona should consult academic advisors during those two years for advice in planning a General Studies sequence of courses which will meet Arizona State University General Studies requirements.

Out-of-state transfer students should contact the Undergraduate Admissions Office. (See page 26 of this *Catalog*.)

Students wishing to enroll in the College of Education may declare their pre-professional status during their freshman or sophomore year. At that time, students should seek advisement within the College of Education through its Office of Educational Services, Payne Hall, Room B-7.

Program of Study

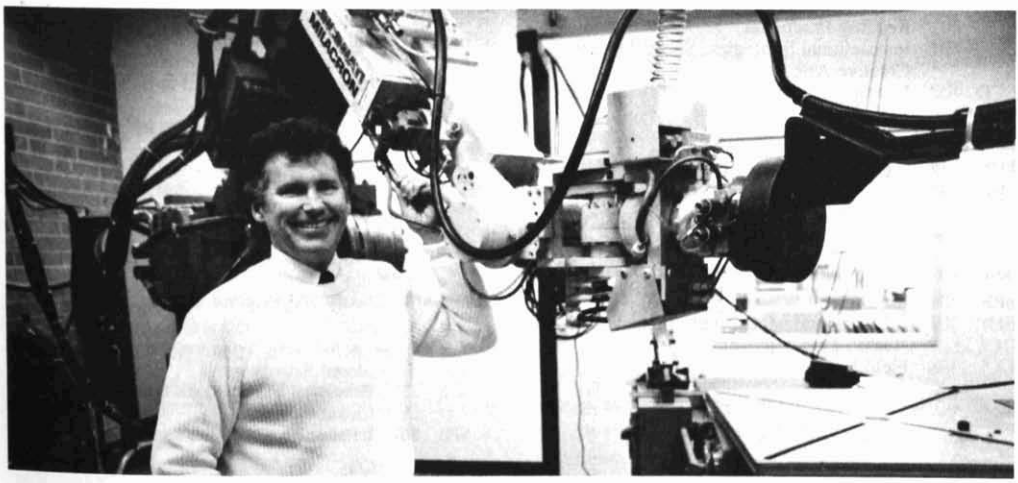
Students admitted to the PTPP must file a program of study during the first semester of the program. A program of study for the four-semester professional program will include core courses for *all* students, regardless of program option selected. Additional courses are required to meet degree requirements in the specific program options of Early Childhood Education, Elementary Education, Secondary Education and Special Education. To complete a program of study in four semesters, full-time study is required.

The general pattern listed below should be followed for each of the program options in the PTPP in the development of a program of study. Students should consult an advisor for assistance and must file a program of study during the first semester of the program. A minimum of 56 hours of approved General Studies courses must be completed before the professional sequence in any program option is begun.

Any exceptions to the above requirements must be approved by the Admissions, Scholarship and Standards Committee of the College of Education.

Human Development Specialization. Elementary, Early Childhood, Secondary and Special Education students enrolled in the PTPP must complete an 18 semester hour specialization in human development. Elementary and Early Childhood students are required to include MCE 446, Understanding the Culturally Diverse Child, as part of their human development specialization. Special Education students are required to include SPE 314, Introduction to Bilingual/Multicultural Special Education, in their human development sequence of courses.

Academic Specialization. Elementary, Early Childhood and Special Education students in the PTPP must also complete an 18 semester hour academic specialization in an area of study outside the College of Education.



Four-Semester Requirements
Professional Teacher Preparation Program

Elementary Education (K-8) Option

Semester I – 7 semester hours

SPF 301 Culture and Schooling
EDP 301 Learning and Motivation in Education
DCI 301 Human Development
DCI 396 Field Experience

Semester II – 7 semester hours

EDP 302 Assessment and Evaluation in Education
CBE 300 Computers in Education
DCI 302 Principles and Applications of Effective Instruction
DCI 303 Classroom Organization and Management
DCI 396 Field Experience

Semester III – 11 semester hours

RDG 401 Decoding, Reading and Language Arts
RDG 402 Reading Practicum
EED 401 Teaching Science and Social Studies to Children
EED 402 Teaching Strategies in Mathematics
EED 496 Field Experience

Semester IV – 14 semester hours

EED 478 Student Teaching (12)
SPF 401 Theory and Practice in Education (2)

Early Childhood Education (K-3) Option

Semester I – 7 semester hours

SPF 301 Culture and Schooling
EDP 301 Learning and Motivation in Education
DCI 301 Human Development
DCI 396 Field Experience

Semester II – 7 semester hours

EDP 302 Assessment and Evaluation in Education
CBE 300 Computers in Education
DCI 302 Principles and Applications of Effective Instruction
DCI 303 Classroom Organization and Management
DCI 396 Field Experience

Semester III – 11 semester hours

RDG 401 Decoding, Reading and Language Arts
RDG 402 Reading Practicum
ECD 401 Instructional Strategies: Social Studies, Creative Arts
ECD 402 Instructional Strategies: Math, Science
ECD 496 Field Experience

Semester IV – 14 semester hours

EED 478 Student Teaching (12)
SPF 401 Theory and Practice in Education (2)

Secondary Education (7-12) Option

Semester I – 7 semester hours

SPF 301 Culture and Schooling
EDP 301 Learning and Motivation in Education
DCI 301 Human Development
DCI 396 Field Experience

Semester II – 7 semester hours

EDP 302 Assessment and Evaluation in Education
RDG 301 Content Area Reading: Decoding
RDG 302 Content Area Reading: Practicum
CBE 300 Computers in Education
DCI 302 Principles and Applications of Effective Instruction
DCI 396 Field Experience

Semester III – 7 semester hours

____ 480 Major Methods
SED 403 Principles, Curricula and Methods
SED 496 Field Experience

Semester IV – 14 semester hours

SED 478 Student Teaching (12)
SPF 401 Theory and Practice in Education (2)

Special Education (K-12) Option

Semester I – 18 semester hours

DCI 301 Human Development
SPF 301 Culture and Schooling
EDP 301 Learning and Motivation in Education
RDG 401 Decoding, Reading and Language Arts
RDG 402 Reading Practicum
EED 320 Teaching Science to Children
CBE 300 Computers in Education
SPE 311 Orientation to Education of Exceptional Children
SPE 496 Field Experience

Semester II – 11 semester hours*

DCI 302 Principles and Applications of Effective Instruction
DCI 303 Classroom Organization and Management
EDP 302 Assessment and Evaluation in Education
EED 402 Teaching Strategies in Mathematics
SPE 314 Introduction to Bilingual/Multicultural Special Education
SPE 496 Field Experience

Semester III – 15 semester hours*

SPE 411 Severely Handicapped, Gifted and Regulatory Issues
SPE 412 Evaluating Exceptional Children
SPE 413 Methods in Language, Reading and Arithmetic for Exceptional Children
SPE 414 Methods and Strategies in Behavior Management
SPE 415 Social Behavior Problems of Exceptional Children
SPE 496 Field Experience

Semester IV – 14-17 semester hours

SPE 478 Student Teaching (12)
(3 additional hours required for third endorsement)
SPF 401 Theory and Practice in Education (2)

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* *Select two of the following during semester II or III:*
SPE 312 Mental Retardation
SPE 336 Behavioral and Emotional Problems in Children
SPE 361 Introduction to Learning Disabilities

Advisement

For any program option in the PTPP, students should seek early advisement in the Office of Educational Services (Payne Hall, B-7) and become familiar with specific program and College of Education requirements. Students in Secondary Education must also consult an advisor in departments offering major fields of study in the College of Liberal Arts and Sciences, Business, Engineering and Applied Sciences, or Fine Arts.

Graduation and Degree Requirements

Candidates for the degree of Bachelor of Arts in Education are required to complete an approved program of study of at least 126 semester hours. The College of Education expects its degree candidates to meet individual course assessment standards, field experience observation criteria, and other proficiency standards and performance criteria required to demonstrate knowledge and skill in the areas listed under the Bachelor of Arts description on page 222 of this *Catalog*. Candidates must file for graduation through the Office of Educational Services (Payne Hall, B-7) in order to be recommended by the faculty of the College of Education for graduation.

Certification for Teaching

The College of Education is accredited by the National Council for Accreditation of Teacher Education and approved by the Arizona Department of Education for the preparation of elementary, secondary, and special education teachers. Students who complete an approved program of study and meet all graduation requirements of the university and the college are recommended for certification to the Arizona Department of Education. The Office of Educational Services (Payne Hall, B-7) maintains information about current certification requirements in Arizona and other states.

The College of Education also offers programs of study leading to special endorsements by the Arizona Department of Education. Of special interest are endorsements in the areas of middle school education, bilingual education and English as a Second Language (ESL). The bilingual education endorsement is required of all teachers specifically responsible for providing bilingual instruction. The English as a Second Language (ESL) endorsement is required of all teachers specifically responsible for providing ESL instruction. Students should contact the Office of Educational Services for information and advisement regarding teaching concentrations or special teaching endorsements.

General Studies Requirements

Students must meet all university General Studies and college graduation requirements in order to earn the Bachelor of Arts in Education degree. These requirements are usually met before formal admission to the PTPP. Students should consult an advisor early in their college course work in order to carefully select General Studies courses. The university General Studies guidelines are on pages 42-45 of this *Catalog*.

General Studies courses are regularly reviewed. To determine whether a course meets one or more General Studies course credit requirements, see the listing of courses by core and awareness area, pages 45-66. General Studies courses are also identified following course descriptions according to the following key:

Key to General Studies Credit Abbreviations

L1	Literacy and Critical Inquiry Core Courses (Intermediate level)
L2	Literacy and Critical Inquiry Core Courses (Upper-division)
N1	Numeracy Core Courses (Mathematics)
N2	Numeracy Core Courses (Statistics and Quantitative Reasoning)
N3	Numeracy Core Courses (Computer Applications)
HU	Humanities and Fine Arts Core Courses
SB	Social and Behavioral Science Core Courses
S1	Natural Science Core Courses (Introductory)
S2	Natural Science Core Courses (Additional Courses)
G	Global Awareness Courses
H	Historical Awareness Courses

Academic Standards

Retention and Disqualification

Students admitted to the College of Education on *pre-professional status* are subject to the general standards of academic good standing of the university. Admission to pre-professional status does not guarantee admission to any teacher preparation program offered by the College of Education.

Students admitted to the PTPP within the College of Education must maintain academic standards and demonstrate qualifications for the teaching profession including sound physical and mental health, interpersonal skills, basic communication skills, positive attitude, and satisfactory performance in field experiences.

To be considered in good standing, students must maintain an overall, cumulative grade point average *and* a grade point average in PTPP course work of 2.50 or higher. Any student whose cumulative *and* teacher preparation course work grade point averages fall below 2.50 is placed on academic probation and may not enroll in any courses within the College of Education. Students whose cumulative or teacher preparation course work grade point average falls below a 2.50 are placed on conditional retention. Any PTPP course in which a grade of "D" or lower is earned must be repeated and a grade of "C" or higher earned prior to the final or student teaching semester of a student's program of study.

Students on academic probation or conditional retention must seek advice from the Office of Educational Services prior to registering for additional course work.

Probation and conditional retention status for academic reasons begin on the first day of classes of the semester following the probation or conditional retention action. Students placed on probation for any reason are subject to disqualification by the College of Education at the end of the following semester if the conditions imposed for probation are not met. Students placed on conditional retention for any reason will have their status reviewed at the end of the following semester by the Undergraduate Standards Committee and a recommendation will be made regarding reinstatement, placement on probation, or disqualification.

Students demonstrating behaviors or characteristics that make it questionable whether they can succeed in the teaching profession are reviewed by the Undergraduate Standards Committee of the College of Education. The committee's review may result in a decision to disqualify the student or the specification of conditions under which continued participation is permitted (conditional retention).

Students who wish to appeal decisions of the Undergraduate Standards Committee of the College of Education may do so in writing to the dean of the college or the University Undergraduate Admissions Board or both. Any exceptions to the above retention and disqualification policies and procedures must be approved by the Undergraduate Standards Committee of the College of Education and the dean of the College of Education.

Field Experience Requirements

In addition to course work, students admitted to the PTPP are required to participate in directed field experiences during each semester of the program. The field experiences will vary from short-term observation and participation, to long-term supervised practice teaching. Students should expect these field experiences to be above and beyond the class times listed in the course schedule for each semester. Such field experiences will typically take place in public schools throughout the greater Phoenix area. Regular attendance is required during all field experiences. Students should plan extra travel time and expect to confer with cooperating teachers and supervisors before or after scheduled field experiences. To meet field experience requirements students must plan to have their own transportation and be available during regular school hours.

Student Teaching. The major field experience, called *student teaching*, occurs in the fourth semester of the PTPP. Student teaching also occurs near the end of programs of study in the post-baccalaureate programs.

Applications for student teaching will be accepted during the semester prior to the student teaching semester. To be accepted for student teaching, students must meet the following requirements:

1. Attain an overall GPA of 2.50 or better;
2. Attain a GPA of 2.50 or better in their professional course work;
3. Complete all required professional course work;
4. Remove any academic deficiencies such as grades of "D," "E," or "I";
5. Complete an application procedure and receive approval to student teach from the Office of Educational Services.

Normally, student teaching is only possible during fall and spring semesters. Student teachers must adhere to the calendar, regulations and philosophy of the school in which they are placed. They are encouraged to avoid extra activities and course work which will interfere with the heavy demands required of them.

Special Programs

Post-baccalaureate Certification Programs

Post-baccalaureate programs which lead to teaching certification are designed for those currently in careers in business or industry and other areas and who hold a bachelor's degree. The college offers post-baccalaureate programs in Elementary, Early Childhood, Secondary, and Special Education. Students who wish to be considered for entry must meet the College of Education admission requirements for post-baccalaureate programs which are:

1. An earned bachelor's degree in an area or subject they wish to be certified to teach,
2. 2.50 GPA or better,

3. Passing scores on the pre-professional skills test (PPST),
4. Submission of a completed application form by appropriate deadline dates in the semester prior to admission.

Students who also wish to pursue a master's degree must meet the admission requirements of the Graduate College. A program of study must be filed within the first semester after admission to any post-baccalaureate program. Post-baccalaureate students are subject to the College of Education retention and disqualification standards on pages 204-205 of this *Catalog*. The Office of Educational Services should be contacted for advisement and admission requirements, procedures and deadline dates.

Of special interest is the Military Education and Training program offered by the college for recently retired military personnel or those in their last few years of active service. This on-campus program is carefully designed to meet College of Education program standards and leads to teacher certification. The Office of the Dean of the College of Education should be contacted for further information regarding this program.

Multicultural Teaching Concentration

A concentration in multicultural education is offered at the undergraduate level. Courses in Indian education, multicultural education, and bilingual education and are offered through the Division of Curriculum and Instruction. Courses taken in any area of concentration are usually in addition to regular program requirements.

Selected Studies in Education

An undergraduate student who is interested in a career in education other than public school teaching can elect to develop an individualized degree program. A student who wants to develop a program of selected studies must fulfill College of Education admissions requirements and should contact the Office of Educational Services for program advisement. A program of study must be filed during the first semester of a student's program and be approved by the Undergraduate Standards Committee and the dean of the college. This degree is not designed to lead to teacher certification.

College of Education

All graduate programs of the College of Education include a core of courses designed to give students an understanding of the context in which America's schools operate and of the methods of scholarship by which our understanding of the educational system is deepened.

Master's degree candidates must complete courses COE 501, 504 and 505, for a total of 9 semester hours. Doctoral candidates must complete COE 502, 503, 504 and 505, for a total of 12 semester hours. The core courses are offered each semester and during the summer session. Students are urged to take the core courses early in their program since they form the foundation on which many subsequent courses are built.

These core courses follow.

COLLEGE OF EDUCATION

COE 501 Introduction to Research and Evaluation in Education. (3) F, S
Overview of educational inquiry from controlled, quantitative to qualitative, naturalistic. Emphasis on locating and critically interpreting published research.

502 Introduction to Quantitative Methods. (3) F, S
Topics in statistical analysis, measurement, research design. Exploratory data analysis, estimation theory, statistical inference. Use of computers for data analysis.

503 Introduction to Qualitative Research. (3) F, S
Terminology, historical development, approaches (including ethnography, ethnomethodology, critical theory, grounded theory, hermeneutics), qualitative versus quantitative social sciences; methods of inquiry.

504 Learning and Instruction. (3) F, S
Introduction to psychology of learning and instruction. Includes the foundations of learning theories and their application to educational practice.

505 American Education System. (3) F, S
Political, social, historical and philosophical analyses of American education at all levels. Examination of primary sources, legal findings, case studies.

Division of Curriculum and Instruction

(Payne Hall B-225, 965-1644)

PROFESSORS:
J. E. BELL, J. W. BELL, BERLINER, BITTER, EDWARDS, FAAS, HAGGERSON, HIGGINS, HOWELL, MALONE, MOORE, MOYER, NILSEN, PRIETO, RAY, RUTHERFORD, SATTERTHWAITE, SCHON, SEARFOSS, SILVAROLI, STROM, WALLEN, ZUCKER

ASSOCIATE PROFESSORS:
GREATHOUSE (ED B-225), ANDERSON, AXFORD, CHRISTINE, COHEN, COHN, EDELSKY, EEDS, FINER, HARDT, JACOBS, KAMINS, KNAUPP, MANERA, McCOY, McISAAC, NELSON, PETERSON, ROBERTS, STAHL, STALEY, THOMAS, TIPPECONNIC, VALLEJO, WAMACKS, WISEMAN

ASSISTANT PROFESSORS:
GOMEZ, KNUPFER, SWISHER

PROFESSORS EMERITI:
ARMSTRONG, BATCHELOR, M. BELL, BOYD, BROOK, CHASEY, COOK, CROUCH, DUDEK, FRAZIER, FULLERTON, GILL, GRIFFITH, HOOVER, JELINEK, JONES, KIESOW, KINGSBURY, KOZACIK, LAMM, LEE, McGRATH, MITCHELL, O'BEIRN, O'BRIEN, OLMSTEAD, PODLICH, RICE, ROVER, SCHALL, SHOFSTALL, STEERE, SULLIVAN, SUNDWALL, VEATCH

Program Areas

Adult Education
Educational Media and Computers
Elementary and Early Childhood Education
Multicultural Education
Reading and Library Science
Secondary Education
Special Education

Degrees: B.A.E., M.A., M.Ed., Ed.D., Ph.D.

The Division of Curriculum and Instruction offers undergraduate and graduate academic programs. The undergraduate programs are designed to prepare persons to teach effectively in elementary and early childhood education, secondary education and special education settings. Concentrations available at the undergraduate level include Indian education, multicultural education and bilingual education. Programs of study leading to special endorsement by the Arizona Department of Education are bilingual education, English as a Second Language (ESL), reading and library science.

Post-baccalaureate programs leading to teaching certification are available in Elementary and Early Childhood Education, Secondary and Special Education areas.

The graduate programs in this division are designed to prepare persons for roles such as master teachers, educational leaders, researchers, media and computer specialists and librarians in schools, colleges, universities and governmental agencies or service-oriented organizations, both public and private.

Faculty within the division are engaged in research and professional training projects. Graduate students have opportunities to participate in varied teaching, research and professional training (on- and off-campus) activities.

Curriculum and Instruction

DCI 301 Human Development. (3) F, S
Selected aspects of child and adolescent development with lifespan implications. Emphasis on possibilities for influence by teachers and parents. For majors only. Prerequisite: CDE 232 or equivalent.

302 Principles and Applications of Effective Instruction. (3) F, S
Principals of teaching identified by research on teaching effectiveness. Application of principles to classroom practice. For majors only. Prerequisite: DCI 301.

303 Classroom Organization and Management. (2) F, S
Develops understanding and application of classroom organization and management principles, strategies and procedures. For majors only. Prerequisite: DCI 301.

396 Field Experience. (0) F, S
Observation and limited participation in a school setting. Focus on observation of development, learning, management, instruction, assessment and motivation. Corequisite: semesters I and II of the professional teacher preparation program.

Educational Media and Computers

COMPUTER-BASED EDUCATION

CBE 300 Computers in Education. (1) F, S, SS
An introduction to word processing, databases, spreadsheets, teacher utility programs and evaluation of educational software. Required for education majors.

421 Computer Literacy. (3) F, S, SS
Survey of the role of computers in K-12 schools. Infusion of computer concepts into curriculum and instruction. *[Satisfies General Studies Requirement: N3]*

423 Computer Programming. (3) F, S, SS
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. Prerequisite: CBE 421 or instructor approval.

523 Computer Programming for Instruction. (3) S, SS
Computer programming in BASIC for instructional purposes. Students develop computer-controlled instructional programs. Prerequisite: CBE 423 or instructor approval.

637 Computers in Elementary School Curriculum. (3) SS
Introductory experiences with educational uses of computers; computer awareness, family/societal impact, classroom applications/software, curriculum development, BASIC/LOGO languages, microcomputers.

Special Courses: CBE 494, 580, 584, 590, 591, 592, 598, 692, 792. (See pages 36-37.)

EDUCATIONAL MEDIA

IME 411 Instructional Media Production and Use in Education. (3) F, S, SS
Preparation and utilization of media materials and equipment in teaching. Lecture and lab.

455 Cinema and Television. (3) F, S
An examination of the art, science and impact of animation and special effects in film and television.

521 Instructional Media Design. (3) F, S
Preparing specifications for instructional television, film, slide/tape programs and computer-based instruction.

522 Instructional Media Production Techniques in Education. (3) SS
Production and use of audiotapes, video tapes, slide programs and graphic materials. Lecture and lab.

523 Telecommunication Resources for Instruction. (3) F
Survey and evaluation of commercially available materials for instruction.

524 Instructional Photography. (3) F
The camera, film exposure, composition and lighting. Preparing slides for instructional presentations.

525 Instructional Graphics. (3) S
Principles of design, production and utilization of graphic media in instructional materials. Lecture and lab. Prerequisite: IME 521 or instructor approval.

527 Instructional Television. (3) F
Design and production of instructional programs for television. Lecture and lab. Prerequisite: IME 521 or instructor approval.

528 Advanced Photographic Media Production. (3) S
Design and production of multi-media instructional programs. Emphasis on slide/tape format. Lecture and lab. Prerequisite: IME 521 or instructor approval.

560 Current Issues and Problems in Media/Computer Education. (3) N
Critical analysis of current practices in instructional media/computer. Prerequisite: 6 hours in IME, CBE or instructor approval.

584 Instructional Media Internship. (1-6) F, S, SS
Prerequisites: EDT 502, IME 521 and instructor approval.

Special Courses: IME 494, 498, 499, 500, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

Elementary Education

EARLY CHILDHOOD EDUCATION

ECD 308 Introduction to Early Childhood Education. (3) S
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) F, S
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: ECD 314.

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.

314 The Developing Child. (3) F, S, SS
Provides a base for understanding and working with young children. Examines all aspects of development of children ages 0-8, with implications for teachers and parents. Prerequisite: CDE 232 or equivalent.

322 Communication Arts in Early Childhood Education. (3) F, S, SS
Factors affecting language development. Setting conditions for learning in listening, speaking, reading and writing. Prerequisite: ENG 213 or equivalent.

378 Practicum in ECD. (3) F, S
Provides a field-based experience in selected early childhood settings (outside the public schools prior to student teaching). Prerequisite: ECD 314.

401 Instructional Strategies: Social Studies, Creative Arts. (3) F, S
Presents materials, techniques and resources for a balanced program of social studies and aesthetic expression appropriate for children, preschool through 3rd grade, with emphasis on the integrated curriculum. Corequisites: ECD 402, 496; RDG 401, 402.

402 Instructional Strategies: Math, Science. (3) F, S
Emphasizes developmentally appropriate educational strategies and instructional techniques in teaching mathematics and science to children, preschool through 3rd grade, within an integrated curriculum approach. Prerequisites: MTE 180, BIO 100, PHS 110 or equivalent Corequisites: ECD 401, 496; RDG 401, 402.

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 or equivalent.

496 Field Experience. (1) F, S
Application of course content in a K-3 setting. Emphasis on observation, focus on child-centered curriculum, planning and delivering instruction and assessment. Corequisites: ECD 401, 402; RDG 401, 402.

522 Developmental Social Experiences in Early Childhood Education. (3) S
Materials, techniques, aesthetic 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.

544 Play Education. (3) S, SS
Theories of play and the educational implications of each. Practical applications at the early childhood level.

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.

733 Social and Emotional Development. (3) A
Inquiry into the social and emotional development dynamics in children such as peer relationships, self-concept, parenting processes, with implications for teachers.

744 Evaluative Procedures: Young Children. (3) S
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 36-37.)

ELEMENTARY EDUCATION

EED 313 Childhood and Adolescence. (3) F, S, SS
Principles underlying total development of pre- and early-adolescent children. Emphasis on physical, intellectual, social and emotional development with practical implications for teachers grades 5-9.

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.

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 discipline and to planning, organizing and managing the classroom.

355 Social Studies in the Elementary School. (3) F, S, SS
Methods and materials for teaching Social Studies in the elementary grades.

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 and computer applications with curriculum materials. Classroom observation required. Prerequisite: MAT 180 or equivalent.

401 Teaching Science and Social Studies to Children. (4) F, S
Examines core functions, processes, concepts, materials, goals, objectives, scope and sequence, unit and lesson planning and models of instruction. Corequisites: EED 402, 496; RDG 401, 402.

402 Teaching Strategies in Mathematics. (2) F, S
Strategies and methodologies of teaching elementary mathematics integrating modern technologies, problem solving, manipulatives, current research and learning theories. Prerequisite: MAT 180 or equivalent. Corequisites: EED 401, 496; RDG 401, 402.

478 Student Teaching in the Elementary School. (3-15) F, S, SS
Supervised teaching in the area of specialization. A synthesized experience in curriculum, instruction and classroom management. Prerequisites: 2.50 GPA, completion of professional course sequence and approval of Educational Services.

496 Field Experience. (1) F, S
Application of course content in a (K-8) school classroom. Emphasis on observation, pupil management, planning and delivery of instruction and assessment. Corequisites: EED 401, 402; RDG 401, 402.

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
In-depth examination of problems and achievements experienced by children growing up in a technological society. Emphasis on discovering the child's perspective.

526 Communication Arts in the Elementary School. (3) S, SS
A critical examination of school language arts teaching, focusing on theoretical assumptions regarding oral and written language development.

528 Social Studies in the Elementary School. (3) F, S, SS
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 teaching. Content, materials and approaches to instruction. Prerequisite: EED 380 or equivalent.

578 Student Teaching in the Elementary School. (9-15) F, S, SS
Supervised teaching for postbaccalaureate students, synthesized experience in curriculum, instruction and classroom management. Prerequisites: completion of 21 hours of identified course work from an approved program of study, a GPA of 2.50 (postbac nondegree) or 3.00 (postbac degree) and approval of Educational Services.

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. Prerequisite: EED 380 or instructor approval.

585 Contemporary Issues in Elementary Education. (3) S, SS
A seminar which develops an understanding of a broad range of contemporary issues. Assists 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 36-37.)

Multicultural Education

MULTICULTURAL EDUCATION

MCE 446 Understanding the Culturally Diverse Child. (3) F, S, SS
Physical, social, psychological, developmental and educational needs of children from culturally and linguistically different populations. Multidisciplinary approach will be presented.

447 Methods of Teaching the Culturally Diverse Child. (3) A
Techniques for organizing and providing special educational experiences for students from culturally and linguistically different populations. Prerequisite: MCE 446.

Special Courses: MCE 394, 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

BILINGUAL EDUCATION

BLE 401 Teaching Science and Social Studies to Children. (4) F
Introduction of teaching strategies to be utilized in working in bilingual/ESL classroom settings. Prerequisite: ENG 213. Corequisites: BLE 402, 496.

402 Teaching Strategies in Mathematics. (2) F
Introduction and implementation concepts for teaching mathematics to minority language populations. Corequisites: BLE 401, 402.

478 Student Teaching in the Elementary School. (3-15) F, S, SS
Supervised teaching in the area of specialization. A synthesized experience in curriculum instruction and classroom management in a bilingual education/ESL setting. Prerequisites: 2.50 GPA, completion of professional course sequence and approval of Office of Educational Services.

496 Field Experience. (1) F, S
Application of course content in a bilingual/ESL school setting. Emphasis on observation, pupil management, planning and delivering instruction and assessment. Corequisites: BLE 401, 402.

511 Introduction to Bilingual Education. (3) F, S
Provides an overview of models of bilingual education and focuses on general teaching strategies for bilingual classrooms. Primarily Spanish-English considerations.

514 Bilingual/Multicultural Aspects of Special Education. (3) S
Theories and issues related to the education of bilingual and culturally diverse exceptional children.

515 Instructional Methods for Bilingual Students. (3) F, S
Provides an introduction to the development and implementation of instructional strategies appropriate for language minority populations.

533 Reading-Teaching Bilingual Students. (3) F, S
Acquaints teachers with theory and practice in second language acquisition and with strategies for developing word recognition and comprehension in native language and second language reading (Spanish-English emphasis)

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, SPE and SPF on pages 182, 270 and 277-278.

561 Parent Involvement in Language Minority Education Programs. (3) F, S
Course designed to give students, teachers and other personnel insights in working with parents, parent organizations, community groups and other agencies on education-related issues.

580 Practicum. (1-6) F, S
Provides for practical application in school settings of principles of bilingual education or English as a second language.

Special Courses: BLE 394, 494, 498, 499, 580, 584, 590, 591, 592, 593, 594, 598, 690, 691, 784, 790, 791, 799. (See pages 36-37.)

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.

490 Problems of Teachers of Indian Students. (3) S
Current issues, trends and problems encountered by teachers. Viable solutions discussed. Research reviewed and evaluated. Prerequisite: IED 411.

500 PS: Administration and Management of Indian Education Programs. (3) A
Examination of administrative and programmatic practices related to the schooling of American Indian populations.

502 PS: Development of Indian Cultural and Language Materials. (3) A
Provides a cultural/language approach to curriculum development. Examination of instructional materials used in American Indian bilingual/bicultural education programs.

511 Community Schools in Indian Education. (3) A
Development, implementation and administration of Indian community schools. Techniques and methods for effective school-community relations.

522 Family Literacy in Language Minority Communities. (3) F, S, SS
Examines theories and practices related to literacy development in adults. Special emphasis is given to Native American families.

544 Role of Tribal, State and Federal Government in Indian Education. (3) A
Examines responsibilities and relationships of each agency in the operation of Indian education programs. Analyzes legislation, financial resources and tribal control.

594 Workshop in Indian Education. (6) SS
Practical approaches to teaching Indian students. Curriculum and materials development, community involvement, current issues and research examined.

Special Courses: IED 394, 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

Reading and Library Science

READING

RDG 301 Content Area Reading: Decoding. (1) F, S
Required course for all secondary education candidates. Introduces theory and instructional strategies for learning from text across academic disciplines.

302 Content Area Reading: Practicum. (1) F, S
Supervised field experiences applying instructional strategies introduced in RDG 301. Required course for all secondary education candidates. Prerequisite: RDG 301.

314 The Teaching of Reading. (3) F, S, SS
For elementary teachers-in-training; aimed at improving classroom reading programs and practices. Course provides basic teacher skills, evaluation, classroom environments and reading methods. Discussion sessions might be included. Prerequisite: ENG 213 or equivalent.

315 Decoding in Reading. (3) F, S, SS
Emphasizes linguistic and psycholinguistic aspects of reading. Includes teaching sound/symbol correspondences through phonics methods. Discussion sessions might be included. Prerequisite: RDG 314.

401 Decoding, Reading and Language Arts. (2) F, S
Required course for elementary, early childhood and special education candidates. Decoding (phonics), vocabulary, comprehension and evaluation concepts are introduced. Prerequisite: ENG 213 or equivalent. Corequisites: ECD 401, 402, 496; RDG 402; *or* EED 401, 402, 496; RDG 402; *or* CBE 300; DCI 301; EDP 301; EED 320; RDG 402; SPE 311; SPF 301.

402 Reading Practicum. (2) F, S
A supervised school based practicum utilizing diagnostic and treatment procedures with children experiencing reading difficulty. Required for elementary, early childhood and special education candidates. Corequisites: ECD 401, 402, 496; RDG 401; *or* EED 401, 402, 496; RDG 401; *or* CBE 300; DCI 301; EDP 301; EED 320; RDG 401; SPE 311; SPF 301.

467 Reading in the Content Areas: Secondary. (2) F, S, SS
Introduces reading procedures in subject matter fields. Emphasis: content reading principles and methodology, including decoding. To be taken consecutively with RDG 480.

480 Practicum: Secondary Reading. (1) F, S
Provides for practical application of content reading principles in an on-site secondary school setting. To be taken consecutively with RDG 467.

481 Practicum: Elementary Reading. (3) F, S, SS
Preservice students test and tutor children who are experiencing difficulty with reading. This practicum is scheduled in local schools under direct college supervision. Prerequisite: RDG 314.

505 Developmental Reading. (3) F, S, SS
For classroom and special reading teachers. Specific professional skills in decoding, comprehension and evaluation. Required for special reading endorsement. Prerequisite: teaching certificate.

507 Content Area Reading. (2) F, S, SS
Theory, rationale and teaching strategies concerning learning from text across subject matter disciplines. To be taken consecutively with RDG 508.

508 Practicum: Content Area Reading. (1) F, S, SS
Practical application of content area reading principles in field sites or through on-campus simulations. To be taken consecutively with RDG 507.

533 Reading-Teaching Bilingual Students. (3) F, S
Acquaints teachers with theory and practice in second language acquisition and with strategies for developing word recognition and comprehension in native language and second language reading (Spanish-English emphasis).

544 Comprehensive Secondary Reading Methods and Programs. (3) S
Teaching methods, program development/evaluation and resource work as carried out by the contemporary secondary reading specialist. Prerequisite: RDG 507 and 508.

550 Directed Experiences in Reading. (3) F, S, SS
Practicum experience utilizing diagnostic and instruction techniques of the classroom for corrective reading remediation. Participants tutor assigned students twice a week. Laboratory sections. Prerequisite: RDG 505 or instructor's approval. Required for Special Reading Endorsement.

556 Diagnostic and Treatment Procedures in Reading. (3) F, S, SS
Basic and specialized diagnostic and instruction techniques for corrective and clinical reading remediation. Required for special reading endorsement. Prerequisite: RDG 505.

557 Reading Clinic Experience. (3) F
Practicum experience utilizing specialized diagnostic and instruction techniques for clinical reading remediation. Participants tutor assigned students twice a week. Recommended for special reading endorsement. Laboratory sections. Prerequisite: RDG 556 or instructor approval.

581 Learning to Read with Literature. (3) F, S, SS
For classroom and special reading teachers. The role of literature in the acquisition and development of literacy. Specific suggestions for helping children learn to read using literature as the medium of instruction. Prerequisite: teaching certificate.

629 Seminar: History of Reading Instruction and Research. (3) S
Recurrent themes, prominent authorities and significant research and publications in the history of reading education and related curricula. Prerequisite: instructor approval.

630 Research in Reading. (3) S
For advanced graduate students interested in applied research problems, literature of reading instruction and major issues related to reading research. Prerequisite: instructor approval.

Special Courses: RDG 294, 298, 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 36-37.)

LIBRARY SCIENCE

LIS 410 Children's Literature. (3) F, S, SS
Selecting, analyzing and using modern and classic literature with young readers.

510 Library Automation. (3) S
Library uses of computers. Fundamental concepts and issues in the field of library automation. Prerequisites: LIS 571, 581; or instructor approval.

533 Current Library Problems. (3) F
Critical analysis of current practices and problems in school librarianship. Prerequisites: LIS 540, 561, 571, 581; or instructor approval.

534 Evaluation of Literature for Young Readers. (3) S
Applying standards of literary criticism to literature for young readers. Prerequisite: LIS 410 or instructor approval.

540 Classification and Cataloging. (3) F
Descriptive cataloging and Dewey Decimal Classification of print and nonprint library materials.

561 Selection of Library Materials. (3) F
Principles and procedures used in the selection of materials for the school library.

563 Library Materials for Children. (3) F
Selecting and using print and nonprint materials to support the elementary school curriculum.

564 Library Materials for Adolescents. (3) F
Selecting and using print and nonprint materials to support the secondary school curriculum.

565 Literature for Hispanic Youth/Literatura para Jóvenes Hispanoparlantes. (3) S
Selecting, analyzing and utilizing literature for Hispanic and Spanish-speaking children and adolescents.

571 Basic Reference Resources. (3) S
Providing reference service in the school library. Content and use of basic resources.

581 School Library Administration. (3) S
Administration of K-12 libraries and media centers. Prerequisites: LIS 540, 561, 563 or 564, 571.

584 School Library Internship. (1-6) F, S
Prerequisites: LIS 410, 540, 561, 571, 581. Concurrent enrollment in LIS 581 is permitted.

Special Courses: LIS 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

Secondary Education

SECONDARY EDUCATION

SED 403 Principles, Curricula and Methods. (4) F, S
Advanced level of development of knowledge and skills of instructional planning and methods of teaching and evaluating in the secondary school. Observation/participation required. Corequisite: SED 496.

478 Student Teaching in the Secondary Schools. (3-12) F, S, SS
The practice of teaching. The relationship of theory and practice in teaching. Prerequisites: SED 403; special methods.

480 Special Methods of Teaching Social Studies. (3) F, S
Interdisciplinary approaches; production and collection of materials.

496 Field Experience. (0) F, S
Application of course content in a secondary school setting. Emphasis on observation, pupil management, planning and delivering instruction and assessment. Corequisite: SED 403.

522 Secondary School Curriculum Development. (3) F, S, SS
Social processes, issues, principles, patterns and procedures in curriculum development.

533 Improving Instruction in Secondary Schools. (3) F, S, SS
Analyses of procedures, methods, techniques and experiments in teaching in secondary schools. Prerequisite: SED 578.

566 Evaluating Secondary School Programs. (3) N
Development of evaluative criteria for secondary school programs. Prerequisite: SED 578.

577 Issues and Trends in Secondary Education. (3) N
Analyses of lay and professional reports; problems and issues in American secondary education. Prerequisite: SED 578.

578 Student Teaching in the Secondary Schools. (3-12) F, S
The practice of teaching. The relationship of theory and practice in teaching. Post Baccalaureate students only. Prerequisites: completion of approved post baccalaureate program; a minimum 2.50 GPA; approval of Office of Educational Services.

588 Human Relations in the Secondary Schools. (3) A
Problems in human relations inherent in the interaction of pupils, teachers, administrators, non-professional staff and laymen. Prerequisite: SED 578.

711 Secondary Curriculum Development. (3) S, SS
Theories and processes of developing curriculum; evaluation of research. Prerequisites: SED 522 or equivalent, 578.

722 Improvement of Instruction in the Secondary School. (3) F
Evaluation of the research; issues and theories related to the improvement of instruction. Prerequisite: SED 533.

Special Courses: SED 294, 298, 394, 484, 492, 493, 494, 497, 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 36-37.)

HUMANITIES EDUCATION

HUE 101, 102 Ideas and Values in the Humanities. (4) F, S
Interrelation of art, architecture, literature, music, philosophy, religions, theatre and other performing arts in the modern world. 2 lectures, 2 discussion meetings per week. *[Satisfies General Studies Requirement: HU]*

118 Encountering the Arts. (3) F, S
Introductory course emphasizing personal contacts with the fine and performing arts. Attendance of a wide range of events, with analysis and evaluation.

130 Introduction to Popular Culture. (3) F, S
Reflections of American values in 20th century popular arts. Music, print, art, television, radio, movies, the esthetics of popular culture. *[Satisfies General Studies Requirement: HU]*

401 Humanities in World Cultures. (3-6) N
A humanities study program of foreign travel. Fine and performing arts of the various world cultures. May be repeated for credit. Prerequisite: instructor approval.

480 Methods of Teaching the Humanities. (3) N
Methods of instruction, organization, discussion and presentation of the courses in the interdisciplinary humanities. Prerequisites: HUE 101, 102 or instructor approval.

530 Popular Culture in America. (3) F
The uses of leisure time from a historical perspective. Areas of concern include television and radio, film and stage, music, art and paperbacks.

585 Philosophical Foundations of the Humanities. (3) N
Issues in intellectual traditions of the Western world that are basic to the interdisciplinary humanities. Prerequisite: humanities education graduate standing or instructor approval.

Special Courses: HUE 294, 394, 497, 499, 500, 584, 590, 591, 592, 594, 598, 599, 600, 680, 684, 690, 691, 692. (See pages 36-37.)

SAFETY EDUCATION

SAE 466 Safety Education. (3) N
Safety education in home, school and place of employment.

Special Courses: SAE 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599. (See pages 36-37.)

ADULT EDUCATION

AED 500 Educational Research. (3) N
Introductory course in the analysis, production and use of educational research in the field.

510 Introduction to Adult Education. (3) N
Historical development, core content and principal areas of adult education.

511 Program Development in Adult Education. (3) N
An andrigogical approach to planning programs for adults. Emphasis on agencies.

512 Characteristics of Adult Learners. (3) N
Characteristics of the adult learner throughout the life span.

514 Instructing Adults. (1) A
Theory and practice for instructing adults.

522 Introduction to Educational Gerontology. (3) A
Educational considerations and methods used in teaching older adults from the perspectives of psychology and educational gerontology.

555 Adult Basic/Developmental Education. (3) A
Roles of teacher, student and program in adult basic/developmental education. High school equivalency and related areas.

566 International Adult Education. (3) A
Review and comparison of adult education programs and facilities in selected countries.

EDUCATIONAL FOUNDATIONS

EDF 422 Group Dynamics and Education. (3) F, S
Theory and use of group processes to facilitate human interaction and learning.

500 Educational Research. (3) F, S, SS
Introductory course in the analysis, production and use of educational research in the field.

Special Courses: EDF 494, 500, 590, 598, 599, 691, 791. (See pages 36-37.)

Special Education

SPE 311 Orientation to Education of Exceptional Children. (3) F, S, SS
Includes gifted, mildly handicapped, severely handicapped and the bilingual/multicultural exceptional child. *[Satisfies General Studies Requirement: SB]*

312 Mental Retardation. (3) F, S, SS
Characteristics and assessment specific to mental retardation. Terminology, development, educational programming and therapeutic procedures will be emphasized. Prerequisite: SPE 311.

314 Introduction to Bilingual/Multicultural Special Education. (3) F, S, SS
Theoretical background and practical application of general issues regarding the education of bilingual/multicultural handicapped children. Prerequisite: SPE 311.

336 Behavioral and Emotional Problems in Children. (3) F, S, SS
Characteristics and assessment specific to emotionally and behaviorally disturbed children. Terminology, development and educational programming emphasized. Prerequisite: SPE 311.

361 Introduction to Learning Disabilities. (3) F, S, SS
Characteristics and assessment specific to learning disabilities. Terminology, development and educational programming emphasized. Prerequisite: SPE 311.

411 Severely Handicapped, Gifted and Regulatory Issues. (3) F, S, SS
Presented in three modules: parent, school and community relations, teaching the gifted and teaching the severely handicapped. Prerequisite: SPE 311.

412 Evaluating Exceptional Children. (3) F, S
Normative and criterion-referenced diagnostic techniques including formative evaluation. Emphasis upon application. Practicum included. Prerequisites: EDP 302; EED 380; RDG 401, 402; SPE 311. Corequisites: SPE 413, 496.

413 Methods in Language, Reading and Arithmetic for Exceptional Children. (3) F, S
Methods, techniques and materials for use in prescriptive teaching. Practicum included. Corequisites: SPE 412, 496.

414 Methods and Strategies in Behavior Management. (3) F, S
The organization and delivery of instruction, including formative evaluation techniques. Techniques of behavior management. Practicum included. Prerequisites: SPE 412, 413. Corequisites: SPE 415, 496.

415 Social Behavior Problems of Exceptional Children. (3) F, S
Analysis and intervention into social behavior problems of exceptional populations. Practicum included. Prerequisites: SPE 412, 413. Corequisites: SPE 414, 496.

455 Early Childhood and the Handicapped. (3) S
Early childhood education as it applies to the handicapped child.

478 Student Teaching in Special Education. (3-15) F, S
"Y" grade only. Prerequisites: (1) approval of special education department; (2) completion of SPE 311, 414, 415 and basic introductory course in area of student teaching; and (3) completion of other specified prerequisites.

496 Field Experience. (0) F, S
Application of course content in a special education setting. Emphasis on observation pupil management, planning and delivering instruction and assessment. Corequisite: SPE 412, 413 or 414, 415.

511 The Exceptional Child. (3) F, S, SS
Educational needs of handicapped and gifted children. Not available to students who have completed SPE 311.

512 The Mentally Retarded Child. (3) F, SS
Etiology, diagnosis and management of mentally retarded children. Current trends in prevention, programming and teacher preparation. Not available to students who have completed SPE 312.

513 Methods of Teaching Mentally Retarded Students. (3) S, SS
Specific methods, materials of instruction and curriculum development in teaching educable and trainable children. Prerequisite: SPE 312 or 512.

514 Bilingual/Multicultural Aspects of Special Education. (3) S
Theories and issues related to the education of bilingual and culturally/diverse exceptional children.

515 Methods for the Remediation of Learning Problems of Exceptional Children. (3) S, SS
Methods and materials for remediating the basic academic problems of gifted and mildly-handicapped children. Prerequisites: SPE 511 and a methods course in the teaching of reading and mathematics.

531 Behavior Management Approaches with Exceptional Children. (3) F, SS
Behavior management approaches for classroom behavior of exceptional children. Prerequisite: SPE 511 or equivalent.

536 Characteristics of Behaviorally Disordered Children. (3) F, SS
Variables contributing to behavior patterns of behavior disordered children.

538 Methods of Teaching Behaviorally Disordered Students. (3) S, SS
Development of methods for managing the academic and social behavior of behaviorally disordered children and youth in educational settings. Prerequisite: SPE 336 or 536.

551 Teaching Young Children with Special Needs. (3) S
Methods, materials and curriculum for preschool and primary-aged children with special needs. Prerequisites: SPE 511 and 455 or equivalent.

552 Management of Individuals with Severe Handicaps. (3) F
Instruction and management of school aged and adult individuals with severe, physical or multiple handicaps. Prerequisites: SPE 511 or equivalent and instructor approval.

561 Characteristics/Diagnosis of Learning Disabilities. (3) F, SS
Theories related to learning disabilities including identification and characteristics.

562 Methods of Teaching Learning Disabled Students. (3) S, SS
Various methods and intervention strategies for remediating learning disabilities of children and youth. Prerequisite: SPE 361 or 561.

563 Methods Teaching the Mildly Handicapped Adolescent. (3) A
Identification, remediation and alternative curriculums for exceptional students at the secondary school level. Social and academic variables.

574 Educational Evaluation of Exceptional Children. (3) F, SS
Design and statistical considerations of normative and criterion-referenced tests. Collection, recording and analysis of data from formative evaluation. Prerequisites: SPE 511 or equivalent; a methods course in the teaching of reading and mathematics.

575 Current Issues in the Education of Exceptional Children. (3) F, SS
Mainstreaming, noncategorical, financing, legal diagnostic, labeling, legislative and other critical and controversial issues related to the education of exceptional children.

576 Precision Teaching. (3) S
Theory and techniques which apply to systems of formative evaluation. Emphasis on precision teaching.

578 Student Teaching in Special Education. (3-15) F, S
"Y" grade only. Prerequisites: approval of special education program; completion of SPE 515, 531, 574 and basic introductory course in area of student teaching; and completion of other specified prerequisites.

579 Vocational Programs for the Mentally Retarded. (3) F
Curriculum planning and methods of teaching in secondary school and post-school programs. Work evaluation, work-study, sheltered employment. Prerequisite: SPE 312 or 512.

582 Classroom Research with Exceptional Children. (3) S
Introduction to conducting research. Specific research techniques with primary emphasis on classroom research including applied behavior analysis.

585 Creativity: Research and Development. (3) S
Nature of creativity explored in terms of philosophical underpinnings, empirical evidence, human development, self-actualization and the ecology surrounding the creative event.

588 The Gifted Child. (3) F, SS
Gifted children's characteristics, identification, needs, school and home environments, definitions and misunderstandings. Research by Pressey, Stanley, Terman and others.

589 Methods in Teaching the Gifted. (3) S, SS
Methods in teaching elementary and secondary school gifted children including individualized and computer-assisted instruction, team teaching. Prerequisite: SPE 588.

674 Identification, Evaluation and Classification of Exceptional Children. (3) F
Analysis of the research and theoretical literature focused on the identification, evaluation and classification of exceptional children.

675 Causation of Handicapping Conditions. (3) F
Analysis of the physiological and environmental factors which lead to handicapping conditions. Emphasis given to the development of primary prevention.

681 Instructional Program Development in Special Education. (3) S
Instructional program planning, implementation and evaluation for planning, presentation and evaluation of both college/university and inservice teacher training.

774 Characteristics of Exceptionality. (3) F
Analysis of the literature describing learning, educational, personal-social and cognitive characteristics of exceptional children.

775 Intervention Program in Special Education. (3) S
Analysis of the research literature focused on intervention programs for preschool, school aged and adolescent/adult exceptional persons.

781 Research and Evaluation in Special Education. (3) S
Issues and problems in conducting research and/or evaluation programs involving exceptional children.

Special Courses: SPE 294, 298, 394, 484, 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 684, 690, 691, 692, 780, 790, 791, 792, 799. (See pages 36-37.)

Division of Educational Leadership and Policy Studies

(Farmer Building, ED 108, 965-6347)

PROFESSORS:
APPLETON (ED 107), BELOK, FENSKE, GLASS, HUFF, HUNNICUTT, JOHNSTON, JORDAN, METOS, NORTON, RICHARDSON, SHAFER, SMITH, WEBB

ASSOCIATE PROFESSORS:
BOGART, FARRAR, HARTWELL, LEVAN, PADILLA, WALKER

ASSISTANT PROFESSOR:
CASANOVA

PROFESSORS EMERITI:
ASHE, BONTRAGER, DEMEKE, DRAKE, MENKE, STOUT, WARREN, WOCHNER

Program Areas

Educational Administration and Supervision
Higher Education
Social and Philosophical Foundations

Degrees: M.A., M.Ed., Ed.S., Ed.D., Ph.D.

Programs of the Division of Educational Leadership and Policy Studies Studies are designed to develop leaders, researchers and policy analysts for careers in schools, colleges and private and government agencies. Graduates will be able to examine educational institutions, theories and practices within broad economic, historic, political, social and intellectual contexts in this country and abroad.

Two basic emphases exist within the division's programs. One strand focuses on the administration and policies of educational practices from preschool through secondary education. The other strand focuses on the administration and policies of post-secondary education.

Faculty within the division are involved in both databased and theoretical research. Qualitative and quantitative paradigms are employed. Students have the opportunity to work on research projects in the College of Education and in school districts and educational agencies throughout the country.

Educational Administration and Supervision

(Member: University Council for Educational Administration)

EDA 501 Competency/Performance in Educational Administration. (6) F, S, SS
The nature of educational administration, the concept of competency as it applies to educational 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 Education. (3) N
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) N
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) N
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 instructor approval.

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. (2-3) F, S, SS
Purchasing, budgeting, accounting, payroll management, auditing, financial reporting, insurance and administration of nonteaching personnel and services.

573 School Personnel Administration. (3) S
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, 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: instructor approval.

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) S
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 doctoral program.

722 Administration of Instructional Improvement. (3) S
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 doctoral program.

733 Administrative Management. (3) S
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 doctoral program.

Special Courses: EDA 494, 498, 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 36-37.)

Higher Education

HED 510 Introduction to Higher Education. (3) F, S
An overview of American higher education including philosophical, political and social aspects.

511 Program Development. (2) N
Methods of curriculum development in higher education.

513 Minorities in Higher Education. (1) N
Analysis of policies and issues affecting the participation of racial and ethnolinguistic minorities in post-secondary education.

515 Instructional Personnel. (3) N
Professional roles and responsibilities of instructional personnel in higher education.

516 Management Concepts in Higher Education. (1) N
Introduction to concepts of management theory and practice.

517 Student Support Services in Higher Education. (1) N
Theory, organization and operation of support services for students.

533 The Community-Junior College. (3) F, S
History, functions, organization and current issues. Meets Arizona community college course requirement for certification.

611 Curriculum and Instruction. (3) S
Curriculum development, instructional organization and improvement of instruction in higher education. Prerequisite: HED 510.

633 Research in Higher Education. (1) F, S
Comparative analysis of methods in study of higher education. Prerequisite: EDP 454 or equivalent.

644 Higher Education Finance and Budgeting. (3) S
Financial planning and budgeting in higher education institutions. Issues related to financing public and private colleges and universities. Prerequisite: HED 510.

649 Law of Higher Education. (3) F
Analysis of legal issues related to higher education examination of key court decisions. Prerequisite: HED 510.

664 Community Service, Extension and Continuing Education. (3) S
Objectives, organization and practices of higher education programs offered through the continuing education mode. Prerequisite: HED 510.

689 Administration. (3) F
Theory and practice of administration in higher education institutions. Prerequisite: HED 510.

Special Courses: HED 580, 583, 584, 590, 591, 592, 594, 683, 684, 690, 691, 692, 693, 790, 791, 792, 799. (See pages 36-37.)

Social and Philosophical Foundations

SPF 111 Exploration of Education. (3) F, S
Education as an instrument in the development of the individual and society; its significance as an American institution. *[Satisfies General Studies Requirement: SB]*

301 Culture and Schooling. (2) F, S
For the professional teacher preparation program: an overview of the cultural, social and political milieus in which formal schooling takes place in the United States. For education majors only.

333 Basic Issues in Education. (3) F, S
Important contemporary socio-philosophical issues educators face; analysis and problem solving.

401 Theory and Practice in Education. (1-2) F, S
For the professional teacher preparation program: The analysis and interpretation of classroom behavior from perspectives derived from philosophy, social science and law. For education majors only.

411 History of American Education. (3) N
Social conditions, ideas and institutions which formed American education. *[Satisfies General Studies Requirement: SB]*

494 Special Topics: Third World Women. (3) F
[Satisfies General Studies Requirement: G]

511 School and Society. (3) F, S, SS
Interrelationship of school and society and the role of education in social change.

515 Education of Women. (3) A
Analysis of roles and status of women, educational practices and alternatives.

520 Cultural Pluralism and Education. (3) N
Philosophic analysis of the concept of cultural pluralism and its social implications for American education.

533 Comparative Education in the Western World. (3) F
Educational practices and traditions in the leading nations of Europe and the Soviet Union.

534 Education and Change: Developing Nations. (3) S
Education as economic and socio-political change agent in Africa, Asia, the Middle East and Latin America.

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.

544 Philosophical Foundations of Education. (3) F, S, SS
Theories of education in ancient, medieval and modern classical and contemporary philosophies.

566 History of Education. (3) F, S
Development of educational institutions and ideas in the Western World, from ancient times to the 20th century.

711 Social and Historical Foundations of Education. (3) S, SS
Problems of American education and their socio-historical context.

Special Courses: SPF 294, 298, 484, 492, 493, 494, 497, 498, 499, 580, 583, 584, 590, 591, 592, 593, 594, 598, 599, 600, 680, 683, 684, 690, 691, 692, 693, 780, 783, 784, 790, 791, 792, 799. (See pages 36-37.)

Division of Psychology in Education

(Payne Hall B-301, 965-3384)

PROFESSORS:
HELMSTADTER (ED B-301A), BERLINER, BERNSTEIN, CABIANCA, CARROLL, FRY, GERLACH, GLASS, GRINDER, GUINOUARD, HARRIS, HORAN, KERR, KRUS, KULHAVY, McWHIRTER, NELSEN, NOBLE, OKUN, ROBINSON, SATTLER, SMITH, SNYDER, STOCK, SULLIVAN, VAN WAGENEN

ASSOCIATE PROFESSORS:
ARCINIEGA, ASHER, BETZ, BROWN, BURKE, CHRISTIANSEN, CUMMINGS, GROSS, MAZEN, METHA, MOORE, SHELL

ASSISTANT PROFESSORS:
BARONA, KINNIER

PROFESSORS EMERITI:
BENEDICT, BLACKHAM, BLAESSER, BOETTO, CHURCHILL, DAANE, DAVIS, GAFFNEY, KIMLER, MILLER, MOULTON, NICHOLS, RICHARDSON, STAFFORD, VERGIS, WREN

Program Areas

Counseling
Counseling Psychology
Educational Psychology
Educational Technology

Degrees: M.A., M.Ed., M.C., Ed.D., Ph.D.

The faculty in the Division of Psychology in Education offer graduate degrees in a number of program majors. Master's degrees are offered in the program majors of Counselor Education, Educational Psychology and Educational Technology. Doctoral degrees are offered in the program majors of Counselor Education, Counseling Psychology (a program accredited by the American Psychological Association), Educational Psychology and Educational Technology. In the Ph.D. program in Educational Psychology, concentrations are available in school psychology (a program accredited by the American Psychological Association), quantitative methods, life span developmental psychology and learning.

Students applying to any of these graduate programs are required to submit scores on the Graduate Record Examination and meet application deadline dates. All degree programs require the successful completion of comprehensive examinations.

Additional information on graduate programs may be obtained directly from the division office. Please specify program of interest.

Special Courses: CED 294, 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 36-37.)

Counseling

CED 422 Group Dynamics and Education. (3) A
Theory and use of group processes to facilitate human interaction and learning.

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
Social psychological 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; admission to M.C. or CED doctoral degree program.

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.

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. Prerequisites: CED 680; CPY 622; instructor approval.

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; instructor approval.

681 Supervised Practice. (3) F, S
Supervised experiences in schools or community agencies. Prerequisites: CED 680 and instructor approval.

Counseling Psychology

The doctoral program in counseling psychology is accredited by the American Psychological Association.

CPY 613 Child Counseling. (3) N
Applications of counseling theory in working with children in clinics and elementary schools. Practicum integrated with didactic instruction. Prerequisite: CED 577 or equivalent.

622 Group Counseling. (3) F, S, SS
Theories and methodologies used in group counseling. Prerequisite: CED 567, 577 or equivalent.

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, 577 or equivalent.

644 Psychology of Careers. (3) S
Advanced career counseling: theory, research and practice. Prerequisite: CED 534, 577 or equivalent.

645 Professional Issues and Ethics. (3) F, S, SS
Ethical, legal and professional issues of concern to practitioners and researchers functioning in a variety of settings.

666 Comparative Theories of Personality. (3) F
Comparative analysis of personality theories in relation to counseling practices. Prerequisite: CED 577 or equivalent.

667 Patterns of Behavior Disorders. (3) A
Etiology and treatment of a variety of psychological problems, particularly those represented in DSM III-R. Prerequisite: CED 577 or equivalent.

670 Behavioral Counseling. (3) N
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. Prerequisite: CED 577 or equivalent.

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 or equivalent.

672 Human Diversity: Social Psychological Perspectives. (3) A
Implications for psychological practice of social, psychological and biological factors in the development of behavioral differences.

674 Counseling Women. (3) F
Explores women's development and its implications for counseling. Sexism in mental health, sex differences in diagnosis and psychopathology and women's particular treatment needs.

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. Prerequisites: CED 577 or equivalent; instructor approval.

677 Advanced Counseling. (3) N
Advanced topics in counseling theory, research and practice. Prerequisite: CED 577 or equivalent.

679 History and Systems of Psychology. (3) A
Examination of the development and differentiation of the discipline of psychology from its origins in philosophy to the present.

701 Science and Practice of Counseling Psychology. (3) F
Directed experiences involving the integration of theory, research and practice in Counseling Psychology. Prerequisite: instructor approval.

702 Research Methods in Counseling Psychology. (3) S
The application of experimental and/or quasi-experimental methods to theory construction and treatment evaluation in counseling psychology. Prerequisite: COE 502 or equivalent.

Special Courses: CPY 600, 690, 691, 692, 693, 700, 780, 783, 784, 790, 791, 792, 799. (See pages 36-37.)

Educational Psychology

The doctoral program in school psychology, a concentration within the degree in educational psychology, is accredited by the American Psychological Association.

EDP 301 Learning and Motivation in Education. (2) F, S
Using a case format, learning and motivation principles are applied to education contexts. Education majors only.

302 Assessment and Evaluation in Education. (1) F, S
Using a case format, assessment and evaluation principles are applied to education contexts. Education majors only.

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 6 hours. *[Satisfies General Studies Requirement: SB]*

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. *[Satisfies General Studies Requirement: N2]*

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. Prerequisite: PGS 100 or EDP 310 or equivalent.

530 Theoretical Issues and Research in Human Development. (3) F
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
Classical and cognitive theories of learning, plus recent orientations. Illustrative experimental and rational foundations; implications for educational practice.

542 The Psychology of Learning and Instruction. (3) S
Critical review and evaluation of research on learning variables relevant to acquisition and retention of instructional materials. Laboratory experience.

543 Psychological Research on Life-Span Development. (3) S
Critical review and evaluation of contemporary research on cognitive and affective development across the life span. Prerequisite: EDP 530 or equivalent.

544 Psychology of Reading. (3) N
Alternate analyses of the reading process; designs and procedures for investigating instructional and noninstructional variables related to reading achievement.

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 I. (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 Multivariate Procedures in Data Analysis II. (3) S
Application of multivariate analysis of variance, factor analysis and multivariate categorical analysis. Prerequisite: EDP 554 or passing score on qualifying exam.

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, three hour minimum. Laboratory experience. Prerequisites: EDP 454 and 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 instructor approval.

566 Diagnosis of Learning Difficulties. (3) S
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; instructor approval.

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 Courses: EDP 394, 494, 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 36-37.)

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, 502; instructor approval. Pre- or corequisite: IME 521.

780 Advanced Instructional Development. (1-3) S
Conducting and documenting selected instructional development activities. Prerequisites: EDT 502; instructor approval.

792 Advanced Instructional Research. (3) F
Design and execution of instructional research on selected topics. Prerequisites: EDT 503; instructor approval.

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 36-37.)

College of Engineering and Applied Sciences

George C. Beakley Jr., Ph.D.
Dean

Purpose

The purpose of the College of Engineering and Applied Sciences is to provide a university education of such fundamental background and scope that a student may achieve competency in engineering, agriculture, technology, computer science or construction. Every effort is made to carry on well-rounded, well-integrated programs which will not only give the student proficiency for a professional career but also will develop character, judgment, ideals, breadth of view and appropriate cultural attitudes. Students are taught to recognize the fact that their professional efforts will cause change and that they must accept responsibility for the social consequences of those efforts.

Organization

The material for the College of Engineering and Applied Sciences is presented as follows:

School of Agribusiness and Environmental Resources

Agribusiness
Environmental Resources in Agriculture

School of Construction and Technology

Department of Construction
Department of Aeronautical Technology
- Aeronautical Engineering Technology
- Aeronautical Management Technology

Department of Electronics and Computer Technology
- Electronic Engineering Technology

Department of Industrial Technology
- Industrial Technology

Department of Manufacturing Technology
- Manufacturing Engineering Technology

School of Engineering

Department of Chemical, Bio and Materials Engineering
- Chemical Engineering
- Materials Science and Engineering

Department of Civil Engineering
Department of Computer Science
- Computer Science
- Computer Systems Engineering

Department of Electrical and Computer Engineering
Department of Industrial and Management Systems Engineering
- Industrial Engineering
- Manufacturing Engineering

Department of Mechanical and Aerospace Engineering
- Aerospace Engineering
- Energy Systems Engineering
- Engineering Science
- Mechanical Engineering

Engineering Special Studies
- Bioengineering
- Microelectronics Manufacturing Engineering
- Nuclear Sciences
- Systems Engineering

Engineering Interdisciplinary Studies
- Business and Pre-Law
- Geological Engineering
- Premedical Engineering

Analysis and Systems
Engineering Core
Society, Values and Technology

Research Centers. The college is committed to becoming one of national prominence in research. In addition, it is the policy of the college to encourage exceptional upper-division undergraduate students, as well as graduate students, to participate with faculty members in research activity. Most

faculty members are conducting research on government or industry-sponsored programs. Research activities include computer science and applications, computer integrated manufacturing, materials science, solar energy, thermosciences, transportation systems, signal processing, computer design, turbine design, aerodynamics, structures, structural dynamics, rotor dynamics, CAD/CAM, solid-state electronic devices, power systems, telecommunications, environmental, nuclear radiation, biomedical, arid land agriculture, semiconductor materials and devices, biotechnology, microelectronics manufacturing and many others. These activities are carried out under the academic divisions or departments listed in the following *Catalog* material and also through the interdisciplinary research centers listed below:

Center for Advanced Research in Transportation
Center for Arid and Tropical New Crop Applied Science and Technology (NEWCAST)
Center for Computer Integrated Manufacturing Systems Research
Center for Energy Systems Research
Center for Environmental Studies
Center for Solid State Electronics Research
Center for Systems Science Research
Center for Telecommunications Research

Center for Professional Development. As the professional "half-life" for engineers and scientists decreases continually in most technical fields, the need for continuing education or "life-long" learning increases with each passing day. In response to this need, the college's Center for Professional Development provides continuing education services to the regional, national and international communities. The center offers a wide variety of technical conferences, institutes, seminars and short courses for professionals engaged in the rapidly changing areas of science and technology.

Degrees

Baccalaureate Degrees. The completion of an approved program of study in agribusiness, environmental resources, computer science, construction or technology leads to the degree of Bachelor of Science (B.S.). The completion of a program of study in engineering or engineering-based interdisciplinary programs leads to the degree of Bachelor of Science in Engineering (B.S.E.) or Bachelor of Science (B.S.). The B.S.E. programs are offered through the engineering departments and the engineering special studies. Course requirements comprising the engineering special studies majors are drawn primarily from the various engineering disciplines. The B.S. programs are offered through the engineering interdisciplinary studies, for which a portion of the specialization course requirements are drawn primarily from non-engineering disciplines.

Integrated B.S.E.-M.S.E. Program. (For School of Engineering students only.) To provide greater program flexibility, qualified students may undertake a program which provides an integrated fourth- and fifth-year sequence of study in one of several fields of specialization in engineering. This gives the student an opportunity to meet the increasing demands of the profession for graduates who can begin their engineering careers at an advanced level.

Students admitted to this program are assigned a faculty committee which will supervise a program of study in which there is a progression in the course work and in which earlier work is given application in the later engineering courses for both the bachelor's and master's degrees. Entry into the integrated program will require an application submitted to the dean through the faculty advisor and the department chair. Applications will be reviewed by a school committee which will recommend the appropriate action to the dean. The application may be submitted in the fifth semester.

Graduate Degrees

Deficiencies for admission to the graduate degree programs will be specified at the time of admission. The Graduate Record Examination (V,Q,A) is recommended but not required unless specified by the respective academic unit. TOEFL scores must be submitted by foreign student applicants before admission is considered. The minimum required score is determined by each academic unit.

Master of Science Degree (M.S.)

Agribusiness and Environmental Resources. This program provides competent students with opportunities to complete advanced studies with emphasis on research. Areas of concentration in Agribusiness are management, marketing, finance, international agriculture and food industry. Areas of concentration in Environmental Resources in Agriculture are natural resource management, range ecology and urban horticulture. Admission requires completion of 18 semester hours in agribusiness and environmental resources or closely related course work. Scores from the GRE or MAT are required. (GMAT accepted for Agribusiness students only.) A minimum of 30 semester hours of approved graduate course work is required, including a thesis. An oral examination in defense of thesis is required.

Computer Science. This graduate program provides an opportunity for qualified students holding a baccalaureate degree in Computer Science or related fields to complete advanced studies with emphasis on research. A minimum of 30 semester hours of approved course work is required, including a thesis. An oral examination in defense of the thesis is required.

Engineering. These are research-oriented graduate degree programs, providing opportunities to highly competent students to major in Chemical, Civil, Electrical, Industrial or Mechanical Engineering, or Engineering Science. Options in aerospace engineering, bioengineering, biotechnology, engineering mechanics, engineering science, materials science and engineering, nuclear sciences and engineering, and system science and engineering are available under the Engineering Science major. (M.S.E. and Ph.D. degree programs are also available in these options). This particular degree program (including all options) is administered through the Office of the College Assistant Dean for Graduate Studies. Admission normally requires an appropriate undergraduate engineering degree and satisfaction of all Graduate College admission requirements, as well as special department requirements. A minimum of 30 semester hours of approved graduate course work is required, which must include a thesis and an oral examination at completion of the program. Students writing a thesis must enroll in a combination of both 592 Research and 599 Thesis totaling 6 semester hours.

Master of Science in Engineering Degree (M.S.E.)

Engineering. These are professionally oriented graduate degree programs intended as a preparation for a career in professional practice. Two options are available: the first is a thesis (engineering report or research paper); the second is a no thesis, no report. Both options require a minimum of 36 semester hours of approved graduate-level course work. Entry requires satisfying all Graduate College admission requirements, special department requirements, and a baccalaureate degree with a major in Engineering or other closely related degree program.

Option 1: Designed primarily for full-time students. The M.S.E. degree option 1 is awarded upon successful completion of graduate course work, engineering projects and research endeavor resulting in a thesis (engineering report or research project). A final oral examination is required in defense of the thesis.

Option 2: Designed primarily for students who hold full-time jobs and must attend university classes on a part-time basis. The M.S.E. degree option 2 is awarded upon successful completion of graduate course work. A final written comprehensive examination of the graduate course work taken for the degree and over the respective undergraduate prerequisites is required. Students selecting this option should check with their respective department for format of the final examination.

Master of Technology Degree (M.Tech.)

Technology. This degree program is designed for flexibility permitting the student to select a combination of courses in technology and supporting areas to meet individual career goals. Selected areas of concentration are designed to provide graduates with technical and professional skills for use in preparation for and advancement in leadership positions found in industry and education. The Master of Technology with a major in Technology is offered by the Departments of Aeronautical Technology, Electronics and Computer Technology, Industrial Technology and Manufacturing Technology. Admission requires an appropriate baccalaureate degree with a minimum of 30 semester hours in technology or equivalent. Scores from the GRE are required. A minimum of 32 semester hours of approved course work is required, including a practicum or applied project. An oral examination in defense of the practicum or applied project is required.

Doctor of Philosophy Degree

Engineering. The Ph.D. degree is awarded in Engineering or Computer Science upon the satisfactory completion of an approved program of graduate study, research and dissertation. For specific reference to this degree, see the Graduate College section of this *Catalog* or the *Graduate Catalog*.

Admission

Students who wish to be admitted to freshman standing in the College of Engineering and Applied Sciences should present certain secondary units which are specified in the requirements of the three schools. Students who have omissions or deficiencies in secondary school subject matter preparation may be required to complete additional university course work which may not be applied toward their degree.

Students not admissible to programs in this college who enroll in another college at ASU may not register for any 300- or 400-level courses in this college, unless such courses are required in their degree programs and students have the proper course prerequisites.

Entrance requirements of this college may differ from those of other academic units on campus. Students may be admitted under two different classifications, as follows:

Professional Program. For admission to a *professional program* in one of the departments of the college: Students must meet the following requirements:

	Minimum Scores			
	H.S. Rank	ACT	SAT	TOEFL*
Agribusiness and Environmental Resources	Upper 50%	**	**	500
Computer Science (all degrees)	Upper 20%	24	1100	550
Construction	Upper 50%	23	1050	550
Engineering	Upper 25%	23	1050	550
Technology	Upper 50%	**	**	500

* *For international students (includes those students with permanent residency classification).*

** *Same as university requirements, see page 23.*

Students admitted to the university by the GED (General Education Development) are required to take either the ACT or the SAT in order to be admitted to a professional program.

Pre-Professional Program. For admission as a *pre-professional* student to one of the departments or schools of the college: Students not admissible to a professional program within the college but who are otherwise admissible to Arizona State University, may be admitted as a pre-professional student for the selected major. This includes international students whose TOEFL scores do not meet the above minimum scores. Students admitted into this classification will follow the freshman-sophomore sequence of courses as required by their chosen major. Courses will be selected with the assistance of an academic advisor. After completing a minimum of 30 semester hours of required or approved elective courses *with a cumulative GPA equivalent to that required of transfer students and corresponding to the chosen major*, students may apply for admission to the professional program. *International students must also submit a* TOEFL *score equivalent to that required for admission to the professional programs.* Students who are admitted as pre-professional students will not be permitted to register for 300- or 400-level courses in the College of Engineering and Applied Sciences until their status is changed to the professional classification.

Readmission. Students applying for readmission to professional status for any program in this college must have a cumulative GPA for all college course work equal to that of the transfer admission requirements shown below. If a student does not meet these requirements, he/she may request admission to the pre-professional program, subject to the restrictions shown above.

Transfer into and within College. Students transferring into or between departments within the college or other colleges within the university must have at least a cumulative GPA necessary to meet the *Catalog* requirements of the new department in effect at the time of transfer. Students transferring from an Arizona community college, who have been in continuous residence, may continue under the catalog in effect at the time of entering the community college.

Transfer Students. Students who contemplate transferring into this college from other institutions, whether they be community colleges or four-year institutions, should study carefully the pertinent sections under this college pertaining to their particular program and, if possible, consult an advisor in this college prior to enrolling in that other institution. This will assure a smooth transition at the time of transfer. Transfer students may request admission to either pre-professional or professional status in any of the programs offered by this college. The restrictions with regard to pre-professional status are shown above. The departments and schools may impose additional admission and graduation requirements to those minimums specified by the college.

No grades lower than "C" will be accepted as transfer credit to meet the graduation requirements of this college.

The minimum requirements for admission of transfer students to the professional program are as follows:

	Transfer GPA*	TOEFL**
Agribusiness and Environmental Resources	2.00	500
Computer Science (all degrees)	2.75	550
Construction	2.25	550
Engineering	2.50	550
Technology	2.25	500

* The cumulative GPA will be calculated using all credits from ASU and from other colleges and universities.

** For international students (including those students with permanent residency classification).

Credit is granted for transferred courses which are adjudged to be equivalent to corresponding courses in the selected program of study, subject to grade and senior residence requirements. Credits transferred from a community college will be applied only as lower-division credits. Prospective Arizona community college transfer students

should consult their advisor and refer to the annual *Arizona Higher Education Course Equivalency Guide* for a listing of the acceptable courses transferable to the various college degree programs.

It should be noted that some courses taken in other colleges of this university or other universities may be acceptable for general university credit but may not be acceptable toward the degree requirements of this college. Determination of those particular courses acceptable to a specific degree program will be made within the appropriate department or school with the approval of the dean.

Advisement

For assistance and counseling in planning a program of study, each student in this college will be assigned a faculty advisor who is familiar with the chosen field of specialization and who must be consulted before registering each semester. The student should inform the advisor of any outside work or activity, so that course loads may be adjusted accordingly.

The associate director of Student Academic Services is also available to all students for counseling and advising.

Student Recruitment and Minority Relations. The assistant director of Student Recruitment and Minority Relations is available to assist prospective and newly admitted students with a variety of services related to academic and personal concerns. Advisement and assistance is provided in the procurement of financial aid and scholarships, particularly for top scholars.

Degree Requirements

For detailed information on the degree requirements of each major in the College of Engineering and Applied Sciences, refer to that department's or school's individual descriptions on the ensuing pages.

English Proficiency Requirement. English proficiency is required. As a minimum each student must complete ENG 101 and ENG 102, or ENG 105, but any student whose written or spoken English in any course is unsatisfactory may be required to take additional course work by the appropriate director or department chair. See statement on English proficiency, page 33.

Pass-Fail Grades. Students enrolled in the College of Engineering and Applied Sciences will not receive degree credit for pass-fail courses taken at this institution. In addition, no courses in this college are offered for pass-fail credit. Students requesting credit for pass-fail courses taken at another institution must file a Petition for Variance form. Each request will be judged on its particular merits.

Entry into Upper-Division Courses. Prior to enrolling in courses at the 300-level and above, all students in good academic standing must secure the approval of their advisor. Students who are not in good academic standing must secure the approval of their advisor and director or department chair. Students whose grades in 300-level courses are unsatisfactory may be required to retake one or more courses for which credit has previously been granted.

The departments and schools have certain additional requirements that must be met in addition to the above college requirements. Consult the department or school offering your chosen major.

Course Work Currency. Courses taken more than five years before admission to degree programs in this college will not normally be accepted for transfer credit at the option of the department in which the applicant wishes to enroll. Courses completed within the five years preceding admission will be judged as to their applicability to the student's curriculum.

General Studies

Higher education should provide the student not only with competency in the chosen subject field, but also with experiences which facilitate the student's growth in ability to perceive significant relationships, to make intelligent value judgments, to express ideas with ease, clarity and good taste and to develop the qualities of character and personality requisite for a successful career. The development of moral, ethical and social concepts, along with a sound professional attitude, is required. It is expected that the attainment of an interest and pleasure in the above pursuits will be an inspiration to continued study. Courses are selected with the aid of an advisor to provide planned sequences and to place emphasis on the interrelationships that exist among fields of knowledge.

Specific attention should be directed to the university General Studies requirements shown on pages 42-45. Additional requirements and recommended course selections are shown in appropriate *Catalog* sections for the schools and departments of this college.

General Studies courses are regularly reviewed. To determine whether a course meets one or more General Studies course credit requirements, see the listing of courses by core and awareness area, pages 45-66. General studies courses are also identified following course descriptions according to the following key:

Key to General Studies Credit Abbreviations

L1	Literacy and Critical Inquiry Core Courses (Intermediate level)
L2	Literacy and Critical Inquiry Core Courses (Upper division)
N1	Numeracy Core Courses (Mathematics)
N2	Numeracy Core Courses (Statistics and Quantitative Reasoning)
N3	Numeracy Core Courses (Computer Applications)
HU	Humanities and Fine Arts Core Courses
SB	Social and Behavioral Science Core Courses
S1	Natural Science Core Courses (Introductory)
S2	Natural Science Core Courses (Additional Courses)
G	Global Awareness Courses
H	Historical Awareness Courses

Graduation Requirements

Graduation requirements in this college are listed under the description of each school or major.

Academic Standards

Retention. A student is expected to make satisfactory progress toward completion of degree requirements in order to continue enrollment in the College of Engineering and Applied Sciences. Any one of the following conditions will be considered unsatisfactory progress and will result in the student being placed on provisional (probationary) status:

1. A deficiency of 15 grade points.
2. A semester or summer session with grade point average less than 1.50.
3. Two successive semesters with grade point average less than 2.00.
4. Grades of "E," "W" or "I" in half the semester hours appearing on the official enrollment record for any semester.

Students on probation will be subject to disqualification (1) if they do not attain a 2.25 semester GPA and if their cumulative GPA is below 2.00 at the end of the probationary semester (items 1, 2 and 3 above); (2) if they are placed on probation for two consecutive semesters; or (3) if they receive an "I," "E" or "W" during the provisional semester (for item 4 above). Courses completed during the summer sessions may not be used to reevaluate a student's fall probationary status.

Provisional and probationary students may not register for the next semester without a special permit from the Student Academic Services Office. They may not participate in early registration.

Disqualification. During a semester on provisional status, a student who fails to meet the retention standards specified above will be disqualified. Students may request a review of their disqualification status by contacting the Associate Director of Student Academic Services in the Engineering Center G-Wing. Any disqualified student who is accepted by another college at ASU may not register for courses in this college unless the courses are required for the new major. If a disqualified student does register for courses in this college, he/she may be withdrawn from these courses any time during that semester. Further, students at the university who have been disqualified academically by this college are not eligible to enroll in summer session courses in this college until the disqualification period has expired and they have been reinstated.

Reinstatement. The College of Engineering and Applied Sciences will not accept an application for reinstatement until the disqualified student has remained out of this college for at least a 12-month period. Merely having remained in a disqualified status for the above period of time does not, in itself, constitute a basis for reinstatement. Proof of ability to do satisfactory college work in the chosen discipline will be required, for example, completing pertinent courses in the discipline at a community college with better than average grades.

Special Programs

Student Academic Services. The Dean's Office in the College of Engineering and Applied Sciences maintains a special office staffed to assist students in various matters. This office coordinates the work of the College Standards Committee and administers the probation, disqualification and readmission processes for those students who are academically deficient.

Academic Honors. Students completing baccalaureate degree requirements will receive the appropriate Honors designations on their diplomas consistent with the requirements specified by the university.

Students in the College of Engineering and Applied Sciences are encouraged to seek information concerning entry into those honor societies for which they may qualify. Membership in such organizations enhances the student's professional stature. The following honor societies are active within the college: (1) Alpha Pi Mu–Industrial Engineering Honor Society, (2) Alpha Zeta– Agriculture Honor Society, (3) Eta Kappa Nu–Electrical Engineering Honor Society; (4) Pi Tau Sigma–Mechanical Engineering Honor Society, (5) Sigma Lambda Chi–Construction Honor Society, (6) Tau

Alpha Pi–National Honor Society, Engineering Technologies, (7) Tau Beta Pi–National Engineering Honor Society and (8) Upsilon Pi Epsilon–National Computer Science Honor Society. Information on any of these organizations may be obtained from the respective department or school offices, or the Student Academic Services Office.

Scholarships. Academic scholarships for continuing students in this college may be applied for by contacting the Student Academic Services Office or the various department or school offices. Other scholarships may be available through the university Student Financial Assistance Office.

Cooperative Education. The co-op program is a study-work plan of education which alternates periods of full-time academic study with periods of full-time employment in business, industry and government directly related to a student's major. Students who choose this program ideally complete 12 months of employment and graduate with both the academic background and practical experience gained from working with professionals in their chosen field. Besides the invaluable practical experience gained, co-op can bridge the gap between theory and practice, validate career goals, increase self confidence and provide professional contacts.

A student is eligible to apply upon completion of 45 or more hours of classes in a selected engineering or applied sciences major. Certain positions may require completion of specific courses of study. Transfer students are required to complete at least 12 hours at ASU before beginning work. All student applicants must have a minimum cumulative grade point average of 2.50 and not be on academic probation.

To maintain continuous full-time student status in the university, co-op students must be enrolled in ASE 399, Co-op Work Experience, during each work session. The course is required to obtain the co-op education certificate upon graduation, but does not count toward graduation requirements. Interested students should contact the coordinator of cooperative education in the Engineering Center G-Wing.

ASU 3 + 2 Programs. Students desiring to earn a baccalaureate degree from Grand Canyon College (Phoenix, AZ) in Mathematics, Chemistry or Physics, or from Southwestern University (Georgetown, TX) in Physical Science and a baccalaureate degree in Engineering or Construction from Arizona State University can take advantage of a 3+2 program that has been approved by these institutions. Such students will complete the first three years of study at their respective college or university and the last two years of study at Arizona State University. At the end of the fourth or fifth year, assuming all degree requirements have been met, the baccalaureate degree will be awarded by the student's respective college or university and the appropriate engineering or construction baccalaureate degree will be awarded by Arizona State University. More information can be obtained by writing to one of the following offices:

Office of the Administrative Vice President
Grand Canyon College
3300 West Camelback Road
Phoenix, AZ 85017-1097

or

Provost & Dean of
The Brown College of Arts & Sciences
Southwestern University
Georgetown, TX 78626

or

Office of the Dean
College of Engineering and Applied Sciences
Arizona State University
Tempe, AZ 85287-5506

ROTC Students. Students pursuing a commission through either the Air Force or Army ROTC programs will be required to take from 12 to 20 hours in the Department of Aerospace Studies or Department of Military Science. To preclude excessive overloads, these students should plan on at least one additional semester to complete degree requirements. ROTC students must also meet all other degree requirements of this College.

A military construction option is available in the Department of Construction.

Student Responsibilities

Course Prerequisites. It is expected that students will consult the *Schedule of Classes* and the *Catalog* with regard to course prerequisites. Students who register for courses without the designated prerequisites may be withdrawn without the student's consent at any time prior to the final examination. Such withdrawal may be effected by the instructor, the chair of the department offering the course, the director of the Student Academic Services, or the dean of the college. In such cases, there will be no monetary reimbursement to the student. However, such withdrawal will be considered to be unrestricted as described on page 39 and will not count against the number of restricted withdrawals allowed.

General Information

Definition of Terms. The terms used in this college to describe offerings are defined below for purposes of clarity.

Program of Study–A broad term describing the complete array of courses included in the study leading to a degree. Example: Engineering, Technology, Construction, Agribusiness and Environmental Resources.

Major–A specialized group of courses contained within the program of study. Example: program of study–Engineering; major–Civil Engineering. Example: program of study–Technology; major–Industrial Technology.

Area of Emphasis (technical electives), Option or Concentration is a selection of courses within a major or among one or more majors. The number of technical electives varies from curriculum to curriculum. In a number of the majors the technical electives must be chosen from pre-selected groups. For this reason the choice of specific technical electives for an area of emphasis should be done with the advice and counsel of an advisor. Example: major–Mechanical Engineering; area of emphasis–thermosciences.

School of Agribusiness and Environmental Resources

G. J. Seperich, Ph.D., Director

PROFESSORS:
ASHOOR, BACKHAUS, CHALQUEST, GORDON, METCALF, STILES

ASSOCIATE PROFESSORS:
SEPERICH (AG 281), BRADY, BROCK, EDWARDS, MADDY, RACCACH, STUTZ, WHYSONG, WOOLVERTON

ASSISTANT PROFESSORS:
DIAZ, LOWE, W. MILLER, NIEMIERA

PROFESSORS EMERITI:
BARRETT, JUDD, LYTLE, V. MILLER, MOODY, RASMUSSEN, RICHARDSON, ROBINSON, TAYSOM

Purpose

The School of Agribusiness and Environmental Resources provides academic programs directed toward the agribusiness and environmental aspects of agriculture. Agribusiness is a dynamic industry which provides employment to about 23 percent of the U.S. labor force. Courses in the School of Agribusiness and Environmental Resources are designed to prepare students for the wide range of job opportunities which exist in the agricultural industries and governmental agencies. The academic programs are especially designed to meet the needs of the urban student who has had little or no previous agriculture experience. An interest in plants, animals or foods can be the starting point for career development in agricultural industries or natural resource management. The undergraduate programs also provide the necessary training for students preparing to enter graduate degree programs.

Organization

The academic programs are organized into two separate majors: Agribusiness and Environmental Resources in Agriculture. Options for specialization within these majors are as follows:

Agribusiness

Concentration	*Option*
Agribusiness	General Agribusiness
	International Agribusiness
	Food Industry
Pre-Veterinary Medicine	

Environmental Resources in Agriculture

Concentration	*Option*
Natural Resource Management	Resource Agribusiness
	Range Ecology
	Water and Soil Management
Urban Horticulture	

Center for Arid and Tropical New Crop Applied Science and Technology (NEWCAST)

The NEWCAST Center carries out research and development leading to commercialization of biotechnologies important to agribusiness. As an interdisciplinary center it draws on collaborators from the entire Arizona State University faculty and both private firms and public agencies. While it specializes in new crops and products derived therefrom, itwill act as a resource and manage programs developing new technologies and inventions not directly related to agriculture.

Degrees

Bachelor of Science (B.S.). The School of Agribusiness and Environmental Resources offers the Bachelor of Science degree in Agribusiness and in Environmental Resources in Agriculture.

Master of Science (M.S.). The School of Agribusiness and Environmental Resources offers the Master of Science degree in Agribusiness and in

Environmental Resources in Agriculture. The program includes research and the preparation of a thesis. A minimum of 30 semester hours of graduate-level course work is required for the degree. Additional details for this degree are given in the *Graduate Catalog*.

Admission

See pages 22-27, 40-42, 244-245, and 247 for information regarding requirements for admission, transfer, retention, disqualification and reinstatement.

In addition, students who are beginning their initial college work in the School of Agribusiness and Environmental Resources should present secondary school units in accordance with the minimum university requirements. There are no secondary school agricultural course requirements.

Graduation Requirements

The completion of a minimum of 126 semester hours, including university General Studies, the school and major cores and option courses, leads to the B.S. degree. An overall grade point average of 2.00 is required. Forty percent of the semester hours required for graduation must be upper-division. Also see special graduation requirements under the pre-veterinary medicine concentration described on page 252.

Curricula in Agribusiness and Environmental Resources

The Agribusiness major is an applied, industry-oriented curriculum. The study of animals, plants and their utilization in the food and fiber system forms the base of the program. Students then learn to analyze firms involved in input supply activities, commodity processing, food manufacturing and food distribution. Students also study government agricultural programs and national policy activities which affect agribusiness. Because of the United States' role in supplying commodity and food products to the world markets, international aspects of agribusiness development and trade are emphasized.

Two concentrations exist within the Environmental Resources in Agriculture major. The natural resource management concentration emphasizes the study of wildland ecosystem management. Application of the systems approach in a wide variety of resource management situations is emphasized. Students may pursue an ecological emphasis by choosing the range ecology option or they may pursue a business emphasis by choosing the resource agribusiness option. Students with particular interest in water and soil resources should pursue the water and soil management option. The urban horticulture concentration emphasizes the production, care and marketing of plant materials for urban environments. Students may focus on special interest areas such as commercial horticulture, landscape horticulture or horticultural science.

The baccalaureate degree requirements in Agribusiness and Environmental Resources include the General Studies*, the School of Agribusiness and Environmental Resources core, a proficiency core, the major core, together with the option courses and elective courses to complete the graduation requirement of 126 semester hours. Prior to entering the junior year, each student, with the aid of an advisor, is expected to select a concentration and an option.

Degree Requirements

All students pursuing a B.S. degree in the School of Agribusiness and Environmental Resources must satisfy English proficiency and General Studies requirements as follows:

	Semester Hours
English Proficiency	
† ENG 101, 102 First-Year Composition	6
or ENG 105 Advanced First-Year Composition (3)	
General Studies	
*Literacy and Critical Inquiry**	
(6 semester hours minimum)	
One course, generally at the sophomore level, that includes a series of formal, graded, written or spoken assignments in composing critical literature	3
A second course, upper-division, that involves critical writing in a specialized discipline	3
Numeracy	
(6 semester hours minimum)	
† MAT 115 College Algebra and Trigonometry	4
† ERA 350 Applied Quantitative Methods	3
*Humanities and Fine Arts/ Social and Behavioral Sciences**	
(15 semester hours minimum)	
(At least one course must be upper-division level; two courses must be from same department; and two departments or more must be represented in total selection.)	
Humanities and Fine Arts	9 to 6
Social and Behavioral Sciences	6 to 9
† ECN 111 Macroeconomic Principles (3)	
Natural Sciences	
(8 semester hours minimum)	
† CHM 101 Introductory Chemistry	4
At least one additional course satisfying the Natural Sciences requirement*	4
Total General Studies	36

* See pages 42-56 for specific requirements and approved list.