Department of Aerospace Studies

Air Force ROTC
Col. Ronald Scott Jr.
Chair
(TC 324) 480/965-3181
www.asu.edu/clas/afrotc

PROFESSOR
SCOTT

ASSISTANT PROFESSORS
BLACKLOCK, EVANCHO, GAGE

PURPOSE

The Department of Aerospace Studies curriculum consists of the general military course and history for freshmen and sophomores (AES 101, 103, 201, 203) and the professional officer course for juniors and seniors (AES 301, 303, 401, 403).

General Qualifications. A man or woman entering the Air Force Reserve Officers’ Training Corps (AFROTC) must be the following:

1. a citizen of the United States (noncitizens may enroll but must obtain citizenship before commissioning);
2. of sound physical condition; and
3. at least 17 years of age for scholarship appointment or admittance to the Professional Officer Course (POC).

Additionally, scholarship recipients must be able to fulfill commissioning requirements by age 27. If designated for flying training, the student must be able to complete all commissioning requirements before age 29; persons in other categories must be able to complete all commissioning requirements before age 35.

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 two semester hours for each AES 100- and 200-level class completed for a total of eight 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 POC the last two years of the AFROTC curriculum. Students attend a four-week field training course at an Air Force base normally between the sophomore and junior years. 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 five-week field training course at an Air Force base, the applicant may enroll in the professional officer course (POC) in the AFROTC program. Upon completion of the POC and the college requirements for a degree, the student is commissioned.

Qualifications. The following requirements must be met for admittance to the POC:

1. The four-year student must successfully complete the general military course and the four-week field training course.
2. The two-year applicant must complete a five-week field training course.
3. All students must pass the Air Force Officer Qualifying Test (AFOQT).
4. All students must pass the Air Force physical examination.
5. All students must maintain the minimum GPA required by the college.
6. All students must meet the physical fitness requirements.

**Pay and Allowances.** POC members in their junior and senior years receive $200 per month for a maximum of 20 months of POC 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.** AFROTC offers scholarships annually to outstanding young men and women on a nationwide competitive basis. Scholarships can cover college tuition for nonresident students and provide an allowance for books, fees, supplies and equipment, and a monthly tax-free allowance of $200. Scholarships are available on a four-, three-, or two-year basis. To qualify for a four- or three-year scholarship, a student must be a U.S. citizen and submit an application before December 1 of the 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

Students enrolled in AFROTC at ASU are eligible for a limited number of three- or two-year scholarships. Those students interested must apply through the Department of Aerospace Studies. Consideration is given to academic grades, the score achieved on the AFOQT, and physical fitness. A board of officers considers an applicant’s personality, character, and leadership potential.

**AEROSPACE STUDIES (AES)**

AES 101 Air Force Today I. (2)
fall
Introduction to U.S. Air Force and AFROTC. Topics include: the Air Force mission and organization, customs and courtesies, officer opportunities, officership, and professionalism.

AES 102 Leadership Lab. (0)
fall
Emphasis on common Air Force customs and courtesies, drill and ceremonies, health and physical fitness through group participation. Corequisite: AES 101.

AES 103 Air Force Today II. (2)
spring
Continuation of AES 101. Topics include: the Air Force mission and organization, customs and courtesies, officer opportunities, officership, and professionalism. Prerequisite: AES 101 or department approval.

AES 104 Leadership Lab. (0)
spring
Continuation of AES 102 with more in-depth emphasis on learning the environment of an Air Force officer. Corequisite: AES 103.

AES 201 The Evolution of USAF Air and Space Power I. (2)
fall
Further preparation of the AFROTC candidate. Topics include: Air Force heritage and leaders, communication skills, ethics, leadership, quality Air Force, and values. Prerequisite: AES 103 or department approval.

AES 202 Leadership Lab. (0)
fall
Application of advanced drill and ceremonies, issuing commands, knowing flag etiquette, and developing, directing, and evaluating skills to lead others. Corequisite: AES 201.

AES 203 The Evolution of USAF Air and Space Power II. (2)
spring
Continuation of AES 201. Topics include: the Air Force mission and organization, customs and courtesies, officer opportunities, officership, and professionalism. Prerequisite: AES 201 or department approval.

AES 204 Leadership Lab. (0)
spring
Continuation of AES 202 with emphasis on preparation for field training. Corequisite: AES 203.

AES 301 Air Force Leadership Studies I. (3)
fall
Study of communication skills, leadership and quality management fundamentals, leadership ethics, and professional knowledge required of an Air Force officer. Prerequisite: AES 203 or department approval. General Studies: L

AES 302 Leadership Lab. (0)
fall
Advanced leadership experiences applying leadership and management principles to motivate and enhance the performance of other cadets. Corequisite: AES 301.

AES 303 Air Force Leadership Studies II. (3)
spring
Continuation of AES 301. Topics include: communication skills, ethics, leadership, professional knowledge, and quality management required of an Air Force officer. Prerequisite: AES 203 or department approval. General Studies: L

AES 304 Leadership Lab. (0)
spring
Continuation of AES 302 with emphasis on planning the military activities of the cadet corps and applying advanced leadership methods. Corequisite: AES 303.

AES 401 National Security Affairs. (3)
fall
Examines advanced ethics, Air Force doctrine, national security process, and regional studies. Special topics include: civilian control of the military, military justice, and officership. Prerequisite: AES 303 or department approval. General Studies: L

AES 402 Leadership Lab. (0)
fall
Advanced leadership experience demonstrating learned skills in planning and controlling the military activities of the corps. Corequisite: AES 401.

AES 403 Preparation for Active Duty II. (3)
spring
Continuation of AES 401. Topics include: civilian control of the military, doctrine, ethics, military justice, the national security process, and officership. Prerequisite: AES 401 or department approval.

AES 404 Leadership Lab. (0)
spring
Continuation of AES 402 with emphasis on preparation for transition from civilian to military life. Corequisite: AES 403.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
African American Studies Program

Leanor Boulin Johnson
Director
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www.asu.edu/clas/aframstu

CORE FACULTY
Associate Professors: Boulin Johnson, Eze;
Clinical Associate Professor: Cox

AFFILIATED FACULTY
Anthropology
Senior Lecturer: Winkelman;
Visiting Professor: Usman

Art
Professors: Sweeny, Young

Dance
Faculty Associate: Ganyo

Education
Associate Professor: Hood;
Assistant Professors: Fisher, Matthews

English
Professor: Lester;
Associate Professors: Chancy, DeLamotte, Miller;
Assistant Professor: Fuse

Family and Human Development
Associate Professor: Wilson

History
Associate Professor: Hendricks

Human Communication
Professors: Jain, Martin;
Associate Professor: Davey;
Assistant Professor: Davis

Humanities
Assistant Professor: Lund

Journalism and Telecommunication
Associate Professor: Bramlett-Solomon

Justice Studies
Professors: Jurik, Romero, Zatz;
Associate Professor: Figueria-McDonough;
Assistant Professor: Bernstein

Life Sciences
Associate Professor: Graves (ASU West)

Music
Professor: Sunkett;
Associate Professors: Smith, Solis

Political Science
Associate Professor: Mitchell

Psychology
Faculty Associate: Cota

Recreation Management and Tourism
Associate Professor: Teye

Religious Studies
Associate Professor: Moore

Sociology
Professor: Cobas;
Associate Professor: Keith;
Assistant Professor: Rhea

Theater
Associate Professor: Edwards

Women Studies
Professor: Rothschild

African American Studies (AAS) is interdisciplinary and focuses on people of African descent throughout the world. Focus is given to the diversity of past and present experiences of those who live in the United States as well as in Africa, the Caribbean, South America, and Central America. As an institutional program with a bidisciplinary emphasis, AAS is structured to

1. prepare students of all ethnicities to better understand, value, and more effectively participate in our increasingly diverse society;
2. combine knowledge of the African diaspora with intellectual and practical training in specific areas for the purpose of creating more effective community and global partnerships; and
3. provide students with a foundation for advanced studies in a variety of fields. While the program is dedicated to scholarly research, teaching, and creative activities, it also seeks to build partnerships with community based programs and organizations within Arizona and utilize channels for informing policies which affect the life of Blacks in the diaspora.

AFRICAN AMERICAN STUDIES—B.A.

Course Requirements. The major in African American Studies requires 45 semester hours of course work. A minimum of 30 semester hours must be AFH, AFR, and AFS courses. The remaining course work must be in a related field approved by an AAS advisor. All majors must take 18 hours in the following core courses:

AFH 353 African American Literature: Beginnings Through the Harlem Renaissance L/HU, C.........................3
or AFH 354 African American Literature: Harlem Renaissance to the Present L/HU, C (3)

AFR 210 Introduction to African American Studies C...........3

AFR 429 African American Studies Theory and Methods.........3

AFR 490 Field Studies in the Diaspora...............................3
or AFR 498 Pro-Seminar (3)

AFS 363 African American History to 1865 SB, C, H.............3

AFS 364 African American History since 1865 SB, C, H.........3

Within the 45 semester hours, AAS majors must also take 12 semester hours in one of three concentrations: social and behavioral sciences, humanities/arts, or politics and society. These courses are in addition to the required 18 core course semester hours. Of the remaining course work, 15 hours must be taken in related courses (i.e., non-African American Studies’ prefixes). These courses must be selected from the concentrations (at least one from each concentration) in consultation with the major advisor.

In addition, AAS majors are required to take a minor or a certificate program of a minimum of 18 hours in another academic field.
CERTIFICATE IN AFRICAN AMERICAN STUDIES

Course Requirements. The certificate requires 24 semester hours. Fifteen core hours must be taken from the following courses:

AFR 353 African American Literature: Beginnings Through the Harlem Renaissance L/HU, C ........................................3
or AFR 354 African American Literature: Harlem Renaissance to the Present L/HU, C (3)
AFR 210 Introduction to African American Studies C .........................3
AFR 429 African American Studies Theory and Methods .......................3
AFS 363 African American History to 1865 SB, C, H .........................3
AFS 364 African American History Since 1865 SB, C, H .................3

In addition, one course from each of the three concentrations (i.e., social and behavioral sciences, humanities/arts, politics and society) must be taken. These courses are in addition to the required core courses. Courses should be selected in consultation with the major advisor.

MINOR IN AFRICAN AMERICAN STUDIES

Course Requirements. The minor requires 18 semester hours. All African American Studies minors must take nine core hours from the following courses:

AFH 353 African American Literature: Beginnings Through the Harlem Renaissance L/HU, C ........................................3
or AFR 354 African American Literature: Harlem Renaissance to the Present L/HU, C (3)
AFR 210 Introduction to African American Studies C .........................3
AFS 363 African American History to 1865 SB, C, H .........................3
or AFS 364 African American History Since 1865 SB, C, H (3)

In addition, one course from each of the three concentrations (i.e., social and behavioral sciences, humanities/arts, politics and society) must be taken. These courses are in addition to the required core courses. A minimum of 12 semester hours of upper-division courses is required. Courses should be selected in consultation with the major advisor.

AFRICAN AMERICAN STUDIES (AFR)

AFR Note 1. For Justice Studies students to take a nonrequired 300-level JUS course, they must have at least a “C” in each of the required JUS courses—JUS 105 (or 305), 301, 302, and 303—and a minimum average GPA of 2.50 for these four classes. For non-Justice Studies students to take a 300-level JUS course, they must have a minimum of 56 earned semester hours (junior status) and a minimum cumulative GPA of 2.00. Non-Justice Studies students may take JUS 301, 302, and 303 with school approval.

AFR 210 Introduction to African American Studies. (3)
fall
Examination of the political, historical, and cultural origins of African American studies as an academic discipline. Lecture, discussion.
General Studies: C

AFR 263 Elements of Intercultural Communication. (3)
fall, spring, summer
Basic concepts, principles, and skills for improving communication between persons from different minority, racial, ethnic, and cultural backgrounds. Lecture, discussion. Cross-listed as COM 263. Credit is allowed for only AFR 263 or COM 263. Prerequisite: 2.25 GPA.
General Studies: SB, C, G

AFR 294 Special Topics. (1–4)
not regularly offered

AFR 298 Honors Directed Study. (1–6)
not regularly offered

AFR 305 Principles of Justice Studies. (3)
fall, spring, summer
Introductory overview to the study of justice from a social science perspective. Primary topics include justice theories and justice research. Credit is allowed for only AFR 305 or 105 (or JUS 105). Appropriate for juniors and seniors. Lecture, discussion. Cross-listed as JUS 305. Credit is allowed for only AFR 305 or JUS 305. See AFR Note 1.

AFR 317 Genes, Race, and Society. (3)
spring
Examines history of biological and social constructions of “race” in western society. Lecture, discussion.
General Studies: SB, C, H

AFR 321 Wealth Distribution and Poverty. (3)
twice a year
Examines the distribution and income distribution in the United States and analyzes ideological and political forces producing an increasingly unequal society. Lecture, discussion. Cross-listed as JUS 321. Credit is allowed for only AFR 321 or JUS 321. See AFR Note 1.

AFR 371 Language, Culture, and Communication. (3)
fall and spring
Cultural influences on language communication, including social functions of language, bilingualism, biculturalism, and bidialectism. Lecture, discussion. Cross-listed as COM 371. Credit is allowed for only AFR 371 or 371 COM. Prerequisites: COM 263 (or AFR 263); minimum cumulative ASU GPA of 2.50.
General Studies: SB, C

AFR 394 Special Topics. (1–4)
not regularly offered

AFR 428 Critical Race Theory. (3)
spring
Examination of ways in which race has been historically utilized, constructed, and contested in American civil society. Lecture, discussion.

AFR 429 African American Studies Theory and Methods. (3)
spring
Examines social and behavioral science theories and methodological procedures pertaining to African Americans. Prerequisite: senior standing.

AFR 460 Race, Gender, and Media. (3)
spring
Reading seminar designed to give students a probing examination of the interface between AHAMA Americans and the mass media in the United States. Lecture, discussion. Cross-listed as MCO 460. Credit is allowed for only AFR 460 or MCO 460.

AFR 463 Intercultural Communication Theory and Research. (3)
fall, spring, summer
Survey and analysis of major theories and research dealing with communication between people of different cultural backgrounds, primarily in international settings. Lecture, discussion, small group work. Cross-listed as COM 463. Credit is allowed for only AFR 463 or COM 463. Prerequisites: COM 263 (or AFR 263), 308; minimum cumulative ASU GPA of 2.50.
General Studies: SB, G

AFR 484 Internship. (1–12)
not regularly offered

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AFR 490 Field Studies in the Diaspora. (3)
spring
Introduction to methods and principles of research applied to Black communities within and outside Arizona. Involves working with field officer and faculty. Lecture, field study. Prerequisite: senior standing. Pre- or corequisite: AFR 429.

AFR 492 Honors Directed Study. (1–6)
not regularly offered

AFR 493 Honors Thesis. (1–6)
not regularly offered
General Studies: L

AFR 494 Special Topics. (1–4)
not regularly offered

AFR 497 Honors Colloquium. (1–6)
not regularly offered

AFR 498 Pro-Seminar. (3)
spring
Topic is selected by instructor in consultation with the student. Designed to integrate and develop research skills. Required for majors. Prerequisite: senior standing. Pre- or corequisite: AFR 429.

AFR 499 Individualized Instruction. (1–3)
not regularly offered

AFR 584 Internship. (1–12)
not regularly offered

AFR 598 Special Topics. (1–4)
not regularly offered

AFR 684 Internship. (1–12)
not regularly offered

AFR 784 Internship. (1–12)
not regularly offered

AFRICAN AMERICAN STUDIES HUMANITIES (AFH)

AFH Note 1. Completion of the First-Year Composition requirement (ENG 101 and 102 [or 105] or ENG 107 and 108 with a grade of "C" or higher) is a prerequisite for all English courses above the 100 level.

AFH Note 2. A term paper or equivalent out-of-class written work is required in all upper-division (300- and 400-level) ENG courses.

AFH Note 3. English majors and minors are expected to have completed ENG 200 before taking 400-level literature courses.

AFH 202 Art of Africa, Oceania, and the Americas. (3)
spring
History of art of Africa, Oceania, and the New World. Meets non-Western art history requirement. Cross-listed as ARS 202. Credit is allowed for only AFH 202 or ARS 202.
General Studies: HU, G, H

AFH 210 Introduction to Ethnic Studies in the U.S. (3)
fall and spring
Covers diversity of experiences and relations among racial and ethnic groups in the United States. Lecture, discussion. Cross-listed as APA 210/CCS 210. Credit is allowed for only AFH 210 or APA 210 or CCS 210.
General Studies: C

AFH 225 African American Religion. (3)
not regularly offered
Introduction to the history and development of the African American religious tradition. Lecture, discussion. Cross-listed as REL 225. Credit is allowed for only AFH 225 or REL 225.
General Studies: HU, C

AFH 322 Malcolm and Martin. (3)
not regularly offered
Examines the lives, ministries, contributions, and legacies of Malcolm X and Martin Luther King, Jr. Cross-listed as REL 322. Credit is allowed for only AFH 322 or REL 322.
General Studies: HU, C

AFH 323 Black Religion: A Biographical Approach. (3)
not regularly offered
Examines the experiences, motivations, and contributions of a number of figures associated with African American religion. Cross-listed as REL 323. Credit is allowed for only AFH 323 or REL 323.
General Studies: HU, C

AFH 333 American Ethnic Literature. (3)
fall
Examination of America's multiethnic identity through works of literature that depict American ethnic, gender, and class sensibilities. Cross-listed as ENG 333. Credit is allowed for only AFH 333 or ENG 333. See AFH Notes 1, 2. General Studies: L, C

AFH 347 Jazz in America. (3)
fall, spring, summer
Current practices employed by contemporary jazz musicians; the historical development of jazz techniques. Credit not applicable toward any Music degree. Lecture, discussion. Cross-listed as MUS 347. Credit is allowed for only AFH 347 or MUS 347.
General Studies: HU

AFH 353 African American Literature: Beginnings Through the Harlem Renaissance. (3)
fall
Thematic and cultural study of African American literature through the Harlem Renaissance. Cross-listed as ENG 353. Credit is allowed for only AFH 353 or ENG 353. See AFH Notes 1, 2. General Studies: L/HU, C

AFH 354 African American Literature: Harlem Renaissance to the Present. (3)
spring
Thematic and cultural study of African American literature from the Harlem Renaissance to the present. Cross-listed as ENG 354. Credit is allowed for only AFH 354 or ENG 354. See AFH Notes 1, 2. General Studies: L/HU, C

AFH 401 Focus on Multiethnic Film. (3)
not regularly offered

AFH 459 Studies in African American/Caribbean Literatures. (3)
not regularly offered
Studies in African American or Caribbean literatures according to genre, period, theory, or selected authors. May be repeated for credit when topics vary. Cross-listed as ENG 459. Credit is allowed for only AFH 459 or ENG 459. See AFH Notes 1, 2, 3.

AFRICAN AMERICAN STUDIES SOCIAL SCIENCE (AFS)

AFS 202 Ethnic Relations in the United States. (3)
fall and spring
Processes of intercultural relations; systems approach to history of U.S. interethnic relations; psychocultural analysis of contemporary U.S. ethnic relations. Lecture, discussion. Cross-listed as ASB 202. Credit is allowed for only AFS 202 or ASB 202. General Studies: C, H

AFS 310 African/African American Psychology. (3)
fall and spring

AFS 363 African American History to 1865. (3)
fall
The African American in American history, thought, and culture from slavery to 1865. Cross-listed as HST 363. Credit is allowed for only AFS 363 or HST 333. General Studies: SB, C, H

AFS 364 African American History Since 1865. (3)
fall
The African American in American history, thought, and culture from 1865 to the present. Cross-listed as HST 334. Credit is allowed for only AFS 364 or HST 334. General Studies: SB, C, H

AFS 366 African Civilization Before 1850. (3)
fall and spring
African culture history and precolonial civilization. Meets non-Western requirement. Lecture, discussion. Cross-listed as ASB 366. Credit is allowed for only AFS 366 or ASB 366. General Studies: SB, G, H
AFS 370 Family, Ethnic, and Cultural Diversity. (3)
fall and spring
Integrative approach to understanding historical and current issues related to the structure and internal dynamics of diverse American families. Lecture, discussion. Cross-listed as FAS 370. Credit is allowed for only AFS 370 or FAS 370. Prerequisite: PGS 101 or SOC 101.
General Studies: SB, C

AFS 466 Peoples and Cultures of Africa. (3)
fall and spring
Survey of African peoples and their cultures, external contact, and changes. Meets non-Western requirement. Lecture, discussion. Cross-listed as ASB 466. Credit is allowed for only AFS 466 or ASB 466.
General Studies: SB, G, H

Department of Anthropology

John K. Chance
Chair
(ANTH 233) 480/965-6213
www.asu.edu/clas/anthropology

REGENTS' PROFESSOR
TURNER

PROFESSORS
ALVAREZ, BAHR, BRANDT, CARR, CHANCE, CLARK, COWGILL, EDER, HUDAK, JOHANSON, KINTIGH, KOSS-CHIOINO, MARTIN, MARZKE, MERBS, NASH, B. NELSON, M. NELSON, REDMAN, SPIELMANN, STARK, WILLIAMS

ASSOCIATE PROFESSORS
BARTON, FALCONER, HEGMON, KIMBEL, RICE, WELSH

ASSISTANT PROFESSORS
BAKER, HAENN, JONSSON, LOCKWOOD, REED, STEADMAN

SENIOR LECTURER
WINKELMAN

ASSOCIATE RESEARCH PROFESSORS
SIMON, SUGIYAMA

ASSISTANT RESEARCH PROFESSOR
McCARTNEY

ANTHROPOLOGY—B.A.

Course Requirements. The Anthropology major consists of 45 semester hours, of which 39 must be in anthropology and six in related fields. At least 18 of the semester hours must be in upper-division courses (300–400 level). Three of the six hours in related fields must be in statistics. Related fields are determined by the students in consultation with their advisor. No ASU course is automatically classified as being either related or unrelated. Course requirements for the major are distributed as follows:

Required Introductory Courses
ASB 102 Introduction to Cultural and Social
Anthropology SB, G.............................................3
ASB 222 Buried Cities and Lost Tribes HU/SB, G, H .............................................3
or ASB 223 Buried Civilizations of the Americas HU/SB, G, H (3)
ASM 101 Human Origins and the Development of Culture SB .......3

Distribution Requirements
Archaeology...............................................................6
Geographic area course in archaeology or physical anthropology .......................................3
Geographic area course in ethnography .......................................3
Linguistics...............................................................3
Physical anthropology............................................6
Social/cultural.........................................................6

Elective
Anthropology.............................................................3

Related Fields
Statistics...............................................................3
Approved course ..................................................3

Total.................................................................45

Consultation with the undergraduate advisor and a faculty mentor in the Department of Anthropology is recommended each semester. The anthropology undergraduate advising office is located in ANTH 208.

Course work in anthropology completed at other institutions is evaluated by the undergraduate advisor. The College of Liberal Arts and Sciences requires that transfer students complete at least 12 semester hours of upper-division course work at ASU in the department of their major in order to be eligible for graduation.

In addition to a cumulative GPA of 2.00 or higher, all anthropology students must obtain a minimum grade of “C” in all upper- and lower-division anthropology courses and all related fields.

Each student’s Declaration of Graduation and Degree Audit Report, or Program of Study, must be reviewed and approved by the anthropology undergraduate advisor.

INTRODUCTORY, DISTRIBUTION, AND RELATED FIELDS REQUIREMENTS (45 SEMESTER HOURS)

Consult with an anthropology undergraduate advisor for semester course description booklets and semester schedules, which indicate the regular and omnibus courses being offered. No courses may be used to fulfill more than one Anthropology major or minor requirement.

Required Introductory Courses
ASB 102 Introduction to Cultural and Social
Anthropology SB, G.............................................3
ASB 222 Buried Cities and Lost Tribes HU/SB, G, H .............................................3
or ASB 223 Buried Civilizations of the Americas HU/SB, G, H (3)
ASM 101 Human Origins and the Development of Culture SB .......3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
Distribution Requirements

Linguistics
One course chosen from the following list* ......................... 3
ASB 480 Introduction to Linguistics SB (3)
ASB 481 Language and Culture SB (3)
ASB 483 Sociolinguistics and the Ethnography of Communication SB (3)

Sociocultural
Two courses chosen from the following list* (minimum hours) ..... 6
ASB 202 Ethnic Relations in the United States C, H (3)
ASB 211 Women in Other Cultures HU/SB, G (3)
ASB 311 Principles of Social Anthropology SB (3)
ASB 314 Comparative Religion (3)
ASB 350 Anthropology and Art (3)
ASB 351 Psychological Anthropology SB (3)
ASB 353 Death and Dying in Cross-Cultural Perspective HU/SB, G (4)
ASB 411 Kinship and Social Organization (3)
ASB 412 History of Anthropology L/SB (3)
ASB 416 Economic Anthropology L/SB (3)
ASB 417 Political Anthropology (3)

Archaeology
Two courses chosen from the following list* (minimum hours) ..... 6
ASB 231 Archaeological Field Methods SG (4)
ASB 326 Human Impacts on Ancient Environments SB, H (3)
ASB 330 Principles of Archaeology SB (3)
ASB 335 Prehistory of the Southwest SB, C, H (3)
ASB 337 Pre-Hispanic Civilization of Middle America HU/SB, G, H (3)
ASB 338 Archaeology of North America SB, H (3)
ASB 361 Old World Prehistory I H (3)
ASB 362 Old World Prehistory II H (3)
ASM 338 Anthropological Field Session (2–8)
ASM 365 Laboratory Methods in Archaeology (4)
ASM 435 Archaeological Pollen Analysis (3)
ASM 472 Archaeological Ceramics (3)

Physical Anthropology
Two courses chosen from the following list* (minimum hours) ..... 6
ASM 246 Human Origins (3)
ASM 301 Peopling of the World SB (3)
ASM 341 Human Osteology (4)
ASM 342 Human Biological Variation SG (3)
ASM 343 Primatology (3)
ASM 344 Fossil Hominids H (3)
ASM 345 Disease and Human Evolution (3)
ASM 348 Social Issues in Human Genetics SB (3)
ASM 452 Dental Anthropology SG (4)
ASM 454 Comparative Primate Anatomy (4)
ASM 455 Primate Behavior Laboratory L (3)

Geographic Area Courses

Archaeology or Physical Anthropology
One course chosen from the following list* ......................... 3
ASB 333 New World Prehistory L/SB (3)
ASB 335 Prehistory of the Southwest SB, C, H (3)
ASB 337 Pre-Hispanic Civilization of Middle America HU/SB, G, H (3)
ASB 338 Archaeology of North America SB, H (3)
ASB 361 Old World Prehistory I H (3)
ASB 362 Old World Prehistory II H (3)
ASM 301 Peopling of the World SB (3)

Ethnographic
One course chosen from the following list* ......................... 3
ASB 319 The North American Indian (3)
ASB 321 Indians of the Southwest L/SB, C, H (3)
ASB 322 Indians of Mesoamerica SB, G (3)
ASB 323 Indians of Latin America SB, G (3)
ASB 324 Peoples of the Pacific G (3)
ASB 325 Peoples of Southeast Asia G (3)
ASB 485 U.S.-Mexico Border in Comparative Perspective (3)

Related Fields (six semester hours)
One lower- or upper-division statistics course in mathematics,
sociology, psychology, political science, or history ............... 3
One course from a field related to but outside of anthropology
chosen with advisor ....................................................... 3

Anthropology Elective
Any anthropology course (minimum) ............................... 3

Total ............................................................................................... 45

* Consult with an anthropology undergraduate advisor for courses not listed above that may fulfill distribution requirements.

MINOR IN ANTHROPOLOGY

The Anthropology minor requires 18 semester hours. Two of the introductory courses—from ASB 102, ASM 101, and ASB 222 or 223—are required. The particular introductory courses selected may limit the anthropology courses available in the upper division however. The other 12 semester hours must be upper division and represent at least two of the three subfields of anthropology. The three subfields are:
1. sociocultural anthropology (with linguistics);
2. archaeology; and
3. physical anthropology.

The courses chosen to represent two of the three subfields must be drawn from the “Distribution Requirements” table, page 333, of those two subfields. A minimum grade of “C” is required for all courses taken for the minor in Anthropology.

The minor in Anthropology provides students with a great deal of flexibility in selecting courses. The program has been designed to allow students to focus on areas within the discipline which articulate well with their major. All students interested in the Anthropology minor are encouraged to discuss the options available with an anthropology undergraduate advisor.

CONCENTRATION IN ANTHROPOLOGY FOR B.I.S. MAJORS

For students pursuing the Bachelor of Interdisciplinary Studies (B.I.S.) degree, a concentration in anthropology requires 24 semester hours. All three of the introductory courses—ASB 102, ASM 101, and ASB 222 or 223—are required. The other 15 semester hours must be upper division and represent two of the three subfields:
1. sociocultural anthropology (with linguistics);
2. archaeology; and
3. physical anthropology.

The courses chosen to represent the two subfields must be drawn from the “Distribution Requirements” table, page 333. A minimum grade of “C” is required for all courses taken for the minor in Anthropology for B.I.S. students.

Latin American Studies Certificate or Emphasis. Students majoring in Anthropology may elect to pursue a Latin American Studies Certificate or emphasis, combining courses from the major with selected outside courses of wholly Latin American content. For more information, see “Latin American Studies,” page 326.
Certificate in Museum Studies. See the Graduate Catalog or contact the Department of Anthropology for more information.

GRADUATE PROGRAM

The faculty in the Department of Anthropology offer programs leading to the M.A. and Ph.D. degrees. See the Graduate Catalog for requirements.

SECONDARY EDUCATION—B.A.E.

Social Studies. The major teaching field consists of 63 semester hours, of which 30 hours must be in the anthropology courses required for the B.A. degree. 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 three hours.

SED 480 Special Methods of Teaching Social Studies..........................3
Anthropology .................................................................30
Social sciences ...............................................................15
Social sciences, natural sciences, or psychology ......................15
Total ..................................................................................63

The minor teaching field consists of 24 semester hours in anthropology. Courses ASB 102 and ASM 101 and two upper-division courses in each subfield (archaeology, physical anthropology, and sociocultural anthropology) are required.

ANTHROPOLOGY (ASB)

ASB 102 Introduction to Cultural and Social Anthropology. (3)
fall and spring
Principles of cultural and social anthropology, with illustrative materials from a variety of cultures. The nature of culture. Social, political, and economic systems; religion, aesthetics, and language.
General Studies: SB, G

ASB 202 Ethnic Relations in the United States. (3)
fall and spring
Processes of intercultural relations; systems approach to history of U.S. interethnic relations; psychocultural analysis of contemporary U.S. ethnic relations. Lecture, discussion. Cross-listed as AFS 202. Credit is allowed for only AFS 202 or ASB 202.
General Studies: C, H

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

ASB 211 Women in Other Cultures. (3)
not regularly offered
Cross-cultural analysis of the economic, social, political, and religious factors that affect women's status in traditional and modern societies.
General Studies: HU/SB, G

ASB 222 Buried Cities and Lost Tribes: Our Human Heritage. (3)
spring
Archaeology through its most important discoveries: human origins, Pompeii, King Tut, the Holy Land, Southwest Indians, and methods of field archaeology.
General Studies: HU/SB, G, H

ASB 223 Buried Civilizations of the Americas. (3)
fall and spring
Archaeology through examination of several ancient civilizations of Meso-, South, and North America.
General Studies: HU/SB, G, H

ASB 231 Archaeological Field Methods. (4)
spring
Excavation of archaeological sites and recording and interpretation of data. Includes local field experience. 2 hours lecture, 8 hours lab. Prerequisite: ASM 101 or instructor approval.
General Studies: G

ASB 240 Introduction to Southeast Asia. (3)
fall
Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as GCU 240/HST 240/POS 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.
General Studies: G

ASB 242 Asian American Experiences: An Anthropological Perspective. (3)
fall
Historical and contemporary experiences of Asian Americans in terms of the anthropological concepts of culture, ethnicity, and adaptation. Prerequisite: ENG 101 (or 105).
General Studies: L, C

ASB 250 Anthropology Topics. (3)
spring
Covers five areas of anthropological inquiry. Emphasizes library research, critical analysis, and communication skills relevant to upper-division anthropology course work. Prerequisites: ASB 102; ASM 101 (or its equivalent); completion of the First-Year Composition requirement.
General Studies: L

ASB 252 Anthropology of Sports. (3)
fall and spring
Cross-cultural examination of symbolic and social dimensions of sports past and present.

ASB 302 Ethnographic Field Study in Mexico. (3)
summer
Fieldwork study of cultural adaptation, Mexican culture, United States-Mexican cultural conflict, ethnographic research methods, and local culture. Lecture, discussion, field research. Pre- or corequisite: SPA 101 (or its equivalent).
General Studies: L/SB, G

ASB 311 Principles of Social Anthropology. (3)
spring
Comparative analysis of domestic groups and economic and political organizations in primitive and peasant societies.
General Studies: SB

ASB 314 Comparative Religion. (3)
fall and spring
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.

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

ASB 320 Indians of Arizona. (3)
fall
Traditional cultures and the development and nature of contemporary political, economic, and educational conditions among Arizona Indians.

ASB 321 Indians of the Southwest. (3)
spring
Cultures of the contemporary Indians of the southwestern United States and their historic antecedents. Prerequisite: ASB 102 or instructor approval.
General Studies: L/SB, C, H

ASB 322 Indians of Mesoamerica. (3)
spring
Historic tribes and folk cultures. Prerequisite: ASB 102 or instructor approval.
General Studies: SB, G

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
ASB 323 Indians of Latin America. (3)  
fall  
Indigenous cultures of the Amazon, the Andean region, Central America, and southern Mexico. Lecture, discussion. Prerequisite: ASB 102 or instructor approval.  
General Studies: SB, G  
ASB 324 Peoples of the Pacific. (3)  
not regularly offered  
Peoples and cultures of Oceania focusing particularly on societies of Melanesia, Micronesia, and Polynesia. Prerequisite: ASB 102 or instructor approval.  
General Studies: G  
ASB 325 Peoples of Southeast Asia. (3)  
fall  
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.  
General Studies: G  
ASB 326 Human Impacts on Ancient Environments. (3)  
spring  
World survey of successful and unsuccessful ancient societies and their impacts on the environment.  
General Studies: SB, H  
ASB 327 Action Anthropology. (3)  
fall  
Explores contemporary issues and problem solving in Cuna, Micronesia, Mayan, and U.S. Latino communities, through applied anthropology and community initiatives.  
ASB 330 Principles of Archaeology. (3)  
fall and spring  
Methods and theories for reconstructing and explaining the lifeways of prehistoric peoples. Prerequisite: 3 hours in archaeology.  
General Studies: SB  
ASB 333 New World Prehistory. (3)  
fall  
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. Prerequisite: completion of the First-Year Composition requirement. Pre- or corequisite: 1 upper-division ASU course.  
General Studies: L/SB  
ASB 335 Prehistory of the Southwest. (3)  
fall and spring  
Anthropological understandings of major cultural processes and events in the prehistory of the American Southwest using evidence from archaeology.  
General Studies: SB, C, H  
ASB 337 Pre-Hispanic Civilization of Middle America. (3)  
spring  
Preconquest cultures and civilizations of Mexico. The Aztecs, Mayas, and their predecessors. Prerequisite: ASM 101 or instructor approval.  
General Studies: HU/SB, G, H  
ASB 338 Archaeology of North America. (3)  
not regularly offered  
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.  
General Studies: SB, H  
ASB 350 Anthropology and Art. (3)  
once a year  
Art forms of people in relationship to their social and cultural setting. Prerequisite: ASB 102 or instructor approval.  
ASB 351 Psychological Anthropology. (3)  
spring  
Approaches to the interrelations between the personality system and the sociocultural environment. Prerequisite: ASB 102 or instructor approval.  
General Studies: SB  
ASB 353 Death and Dying in Cross-Cultural Perspective. (4)  
fall  
Humanistic and scientific study of aging, sickness, dying, death, funerals, and grief and their philosophy and ecology in non-Western and Western cultures. 3 hours lecture, 1 hour discussion.  
General Studies: HU/SB, G  
ASB 355 Shamanism, Healing, and Consciousness. (3)  
spring  
World views, practices, and roles of shamans and traditional and contemporary healers; explanatory biopsychological models of consciousness.  
General Studies: HU/SB  
ASB 361 Old World Prehistory I. (3)  
fall  
Biosocial evolution in the Pleistocene, emphasizing technological achievements and the relationship between technology and environment in western Europe, sub-Saharan Africa. Prerequisite: ASM 101 or instructor approval.  
General Studies: H  
ASB 362 Old World Prehistory II. (3)  
spring  
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.  
General Studies: H  
ASB 366 African Civilization Before 1850. (3)  
fall and spring  
African culture history and precolonial civilization. Meets non-Western requirement. Lecture, discussion. Cross-listed as AFS 366. Credit is allowed for only AFS 366 or ASB 366.  
General Studies: SB, G, H  
ASB 400 Cultural Factors in International Business. (3)  
spring  
Anthropological perspectives on international business relations; applied principles of cross-cultural communication and management; regional approaches to culture and business.  
General Studies: G  
ASB 411 Kinship and Social Organization. (3)  
spring  
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 in anthropology or instructor approval.  
ASB 412 History of Anthropology. (3)  
fall  
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.  
General Studies: L/SB  
ASB 416 Economic Anthropology. (3)  
fall  
Economic behavior and the economy in preindustrial societies; description and classification of exchange systems; relations between production, exchange systems, and other societal subsystems. Prerequisite: ASB 102 or instructor approval.  
General Studies: L/SB  
ASB 417 Political Anthropology. (3)  
once a year  
Comparative examination of the forms and processes of political organization and activity in primitive, peasant, and complex societies. Prerequisite: ASB 102 or instructor approval.  
ASB 462 Medical Anthropology: Culture and Health. (3)  
fall  
Role of culture in health, illness, and curing; health status, provider relations, and indigenous healing practices in United States ethnic groups. Lecture, discussion.  
General Studies: C  
ASB 466 Peoples and Cultures of Africa. (3)  
fall and spring  
Survey of African peoples and their cultures, external contact, and changes. Meets non-Western requirement. Lecture, discussion. Cross-listed as AFS 466. Credit is allowed for only AFS 466 or ASB 466.  
General Studies: SB, G, H
ASB 471 Introduction to Museums. (3)
fall
History, philosophy, and current status of museums. Exploration of collecting, preservation, exhibition, education, and research activities in different types of museums. Prerequisites: both ASB 102 and ASM 101 or only instructor approval.
General Studies: L

ASB 480 Introduction to Linguistics. (3)
fall
Descriptive and historical linguistics. Survey of theories of human language, emphasizing synchronic linguistics.
General Studies: SB

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

ASB 483 Sociolinguistics and the Ethnography of Communication. (3)
not regularly offered
Relationships between linguistic and social categories; functional analysis of language use, maintenance, and diversity; interaction between verbal and nonverbal communication. Prerequisites: both ASB 480 and ENG 213 (or FLA 400) or only instructor approval.
General Studies: SB

ASB 485 U.S.-Mexico Border in Comparative Perspective. (3)
spring in odd years
Explores the multicultural and social dimensions of communities along the U.S.-Mexico border, emphasizing social organization, migration, culture, and frontier ideology. Prerequisite: 6 hours in anthropology or instructor approval.

ASB 501 Applied Medical Anthropology. (3)
fall
Overview of anthropology’s applications in medicine and its adaptations to U.S. ethnic populations. Requires research project in medical setting. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 502 Health of Ethnic Minorities. (3)
spring
Prevalence of illness, risk factors, health ecology, and medical and indigenous treatments. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 503 Advanced Medical Anthropology. (3)
fall
Theory in medical anthropology and cross-cultural studies that illustrate particular theories. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 504 Ethnic Relations. (3)
fall
Structural processes of intergroup relations, methods for investigating psychocultural dimensions of ethnicity with focus upon U.S. ethnic groups. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 505 Culture and Psychiatry. (3)
fall
Psychiatry as a cultural phenomenon and indigenous definitions and treatments of mental disorders across cultures. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 506 Gender, Emotions, and Culture. (3)
spring
Relationships among gender and emotion across cultures. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASB 529 Culture and Political Economy. (3)
not regularly offered
Origin and spread of Western capitalism and its impact on non-Western societies. Utilizes ethnographic and historical case studies. Prerequisite: graduate standing.

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

ASB 532 Graduate Field Anthropology. (2–6)
spring
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 its equivalent); instructor approval.

ASB 536 Ethnohistory of Mesoamerica. (3)
not regularly offered
Indigenous societies of southern Mexico and Guatemala at Spanish contact and their postcontact transformation. Emphasis on the Aztec Empire. Prerequisite: graduate standing.

ASB 537 Topics in Mesoamerican Archaeology. (3)
not regularly offered
Changing organization of pre-Columbian civilizations in Mesoamerica is explored through interpretive issues, such as regional analysis, chiefdoms, urbanism, and exchange. Prerequisite: instructor approval.

ASB 540 Method and Theory of Sociocultural Anthropology and Archaeology. (3)
fall
Basic issues concerning concepts of social and ethnic groups, cultural and sociological theory, and the nature of anthropological research. Prerequisite: instructor approval.

ASB 541 Method and Theory of Social and Cultural Anthropology. (3)
spring
Continuation of ASB 540. Prerequisite: ASB 540 or instructor approval.

ASB 542 Method and Theory of Archaeology I. (3)
spring
Models of human evolution, culture change, and interpretation of hunter-gatherer and tribal societies, ceramic, lithic, and faunal materials. Prerequisite: instructor approval.

ASB 543 Method and Theory of Archaeology II. (3)
fall
Covers concepts of social complexity along with economy, demography, and social dynamics, followed by archaeological research design. Prerequisite: instructor approval.

ASB 544 Settlement Patterns. (3)
not regularly offered
Spatial arrangement of residences, activity sites, and communities over landscape. Emphasis on natural and cultural factors influencing settlement patterns. Prerequisite: instructor approval.

ASB 546 Pleistocene Prehistory. (3)
fall
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 361 (or its equivalent).

ASB 547 Issues in Old World Domestication Economies. (3)
spring
Archaeological evidence for transitions in Old World subsistence economies from hunting and gathering to dependence on domesticated plants and animals. Prerequisite: ASB 362 (or its equivalent).

ASB 550 Economic Archaeology. (3)
not regularly offered
Prehistoric economies in hunter-gatherer, tribal, and complex societies. Covers subsistence strategies, craft production and specialization, and exchange. Prerequisite: instructor approval.

ASB 551 Prehistoric Diet. (3)
not regularly offered
Critical review of techniques for recovering dietary information and theoretical models concerned with explaining diet and nutrition. Prerequisite: instructor approval.

ASB 555 Complex Societies. (3)
spring
Examines structural variations in hierarchically organized societies, along with origins, dynamics, and collapse. Seminar.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
ASB 559 Archaeology and the Ideational Realm. (3) not regularly offered

“Postprocessual” and other views concerning relevance of mental phenomena for understanding sociocultural change. Various approaches to inferring prehistoric meanings.

ASB 563 Hunter-Gatherer Adaptations. (3) not regularly offered

Evolution of prehistoric hunter-gatherer societies in the Old and New Worlds from the most ancient times through protohistoric chiefdoms. Prerequisite: instructor approval.

ASB 567 Southwestern Archaeology. (3) spring

Broad coverage of Southwestern cultural developments focusing on current debates and rigorous use of archaeological data in making cultural inferences.

ASB 568 Intrasite Research Strategies. (3) fall

Research issues within a single site context. Topics include quantitative spatial analysis, site definition, sampling, distributional analysis, and substantive interpretation.

ASB 571 Museum Principles. (3) fall

History, philosophy, and current status of museums. Exploration of collecting, preservation, exhibition, education, and research activities in different types of museums. Prerequisites: both ASB 102 and ASM 101 or only instructor approval.

ASB 572 Museum Collection Management. (3) spring

Principles and practices of acquisition, documentation, care, and use of museum collections; registration, cataloging, and preservation methods; legal and ethical issues. Prerequisite: ASB 571 or instructor approval.

ASB 573 Museum Administration. (3) spring

Formal organization and management of museums, governance, personnel matters, fund raising and grantmanship, legal and ethical issues. Prerequisite: ASB 571 or instructor approval.

ASB 574 Exhibition Planning and Design. (3) spring

Exhibition philosophies and development; processes of planning, designing, staging, installing, evaluating, and disassembling temporary and long-term exhibits. Prerequisites: both ASB 571 and 572 or only instructor approval.

ASB 575 Computers and Museums. (3) fall

Basics of museum computer application; hardware and software; fundamentals of database management; issues of research, collections management, and administration.

ASB 576 Museum Interpretation. (3) fall

Processes of planning, implementing, documenting, and evaluating educational programs in museums for varied audiences—children, adults, and special interest groups. Lecture, discussion. Prerequisite: ASB 571.

ASB 577 Principles of Conservation. (3) spring

Preservation of museum objects: nature of materials, environmental controls, and causes of degradation; recognizing problems, damage, and solutions; proper care of objects. Prerequisites: both ASB 571 and 572 or only instructor approval.

ASB 579 Critical Issues in Museum Studies. (3) fall

Current debates of museum practice from an anthropological perspective. Addresses issues of collection, presentation, authenticity, and authority. Seminar. Prerequisite: ASB 571 or instructor approval.

ASB 581 Seminar. (1–12) not regularly offered

Selected topics in archaeology, linguistics, and social-cultural anthropology. Possible topics:

(a) Archaeological Ceramics. (3)
(b) Archaeology of North America. (3)
(c) Cultural Anthropology. (3)
(d) Culture and Personality. (3)
(e) Evolution and Culture. (3)
(f) Historical Archaeology. (3)
(g) Interdepartmental Seminar. (3)
(h) Language and Culture. (3)
(i) Linguistics. (3)
(j) Museum Studies. (3)
(k) Problems in Southwestern Archaeology. (3)
(l) Problems in Southwestern Ethnology. (3)
(m) Social Anthropology. (3)

ANTHROPOLOGY (ASM)

ASM 101 Bones, Stones, and Human Evolution. (3) fall and spring


General Studies: SB

ASM 103 Human Origins and the Development of Culture—Laboratory. (1) fall, spring, summer


ASM 241 Biology of Race. (3)

Human variation and its interpretation in an evolutionary context.

ASM 246 Human Origins. (3)

Fall History of discoveries and changing interpretations of human evolution. Earliest ancestors to emergence of modern humans. Humanity’s place in nature.

ASM 248 Bioarchaeology of Cannibalism, Violence, and Social Pathology. (3) spring

Worldwide review of claims of severely abnormal behavior in prehistory based on perimortem bone taphonomy, analogues, and comparative cases. Lecture, class demonstrations.

ASM 301 Peopling of the World. (3)

Spring Reviews all evidence for human dispersal during the last 100,000 years, origins of language, cultures, races, and beginnings of modern humans. Prerequisite: ASM 101.

General Studies: SB

ASM 338 Anthropological Field Session. (2–8) spring

Anthropological field techniques, analysis of data, and preparation of field reports. May be repeated for credit. Prerequisite: instructor approval.

ASM 341 Human Osteology. (4) fall

Osteology: human paleontology and osteometry. Description and analysis of archaeological and contemporary human populations. 3 hours lecture, 3 hours lab. Prerequisite: ASM 101 or instructor approval.

ASM 342 Human Biological Variation. (4) spring

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 hours lecture, 3 hours lab. Prerequisites: both ASM 101 and MAT 106 (or its equivalent) or only instructor approval.

General Studies: SG
ASM 343 Primatology. (3)
fall
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.

ASM 344 Fossil Hominids. (3)
once a year
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.

ASM 345 Disease and Human Evolution. (3)
fall
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.

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

General Studies: SB

ASM 365 Laboratory Methods in Archaeology. (4)
not regularly offered
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.

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

ASM 448 Geoarchaeology. (3)
fall and spring
Geologic context relevant to archaeological research. Topics include sediments, deposition environments, soils, anthropogenic and biogenic deposits, and quaternary chronology. Lecture, discussion, field experiences. Prerequisites: ASB 222 (or 223) or GLG 101 (or 103) or GPH 111; instructor approval.

ASM 450 Bioarchaeology. (3)
spring
Surveys archaeological and physical anthropological methods and theories for evaluating skeletal and burial remains to reconstruct biocultural adaptation and lifeways. Prerequisite: ASM 101 or instructor approval.

ASM 452 Dental Anthropology. (4)
fall
Human and primate dental morphology, growth, evolution, and genetics. Within- and between-group variation. Dental pathology and behavioral-cultural-dietary factors. 3 hours lecture, 3 hours lab. Prerequisite: instructor approval.

General Studies: SG

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

ASM 455 Primate Behavior Laboratory. (3)
not regularly offered
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, 6 hours lab. Prerequisites: ASM 343; instructor approval.

General Studies: L

ASM 456 Infectious Disease and Human Evolution. (3)
once a year
Study of infectious disease and humanity, using evidence from anthropology, history, medicine, and ancient skeletons. Prerequisite: ASM 345.

ASM 465 Quantification and Analysis for Anthropologists. (3)
spring
Statistical, quantitative, and geometric strategies for envisioning and exploring archaeological, physical anthropological, bioarchaeological, and sociocultural data. Univariate and multivariate methods. Prerequisite: introductory statistical course; instructor approval.

ASM 472 Archaeological Ceramics. (3)
not regularly offered
Analysis and identification of pottery wares, types, and varieties. Systems for ceramic classification and cultural interpretation. 2 hours lecture, 3 hours lab. Prerequisite: instructor approval.

ASM 507 Anthropological Study of Disease. (3)
once a year
In-depth introduction to the study of disease processes from an anthropological perspective. Lecture, seminar. Prerequisite: graduate standing or instructor approval.

ASM 548 Geoarchaeology. (3)
spring
Geologic context relevant to archaeological research. Topics include sediments, deposition environments, soils, anthropogenic and biogenic deposits, and quaternary chronology. Prerequisite: instructor approval.

ASM 555 Advanced Human Osteology. (3)
not regularly offered
Laboratory and field techniques in dealing with the human skeleton. Emphasis on preparation, identification, radiography, sectioning, microscopy, and data processing. 1 hour lecture, 6 hours lab. Prerequisite: ASM 341 or instructor approval.

ASM 565 Quantitative Archaeology. (3)
spring
Formal methods of structuring, codifying, and analyzing data for archaeological problems. Designing research to yield data amenable to productive analysis.

ASM 566 Advanced Topics in Quantitative Archaeology. (3)
fall
Archaeological issues associated with quantitative analysis, e.g., Bayesian and Monte Carlo approaches, simulation, diversity. May be repeated for credit. Prerequisite: ASM 565 or instructor approval.

ASM 573 Lithic Analysis. (3)
not regularly offered
Analysis and interpretation of chipped stone artifacts. Focus on both techniques and underlying concepts and their application to real collections. Prerequisite: instructor approval.

ASM 591 Seminar. (1–12)
not regularly offered
Selected topics in archaeology and physical anthropology. Possible topics:
(a) Bioarchaeology. (3)
(b) Evolution and Culture. (3)
(c) Interdepartmental Seminar. (3)
(d) Physical Anthropology. (3)
(e) Primates and Behavior. (3)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
The major in Conservation Biology consists of a minimum of 45 semester hours in the required major courses and a minimum of 13 hours in related fields, plus a three-semester-hour mathematics proficiency. Required courses are as follows:

BIO 193 The Nature of Biological Science SQ ........................................... 4
or BIO 181 General Biology SQ (4)
and BIO 182 General Biology SG (4)
BIO 320 Fundamentals of Ecology ......................................................... 3
BIO 340 General Genetics ................................................................. 4
or BIO 341 Genetic Analysis (5)
BIO 345 Organic Evolution .................................................................. 3
BIO 353 Cell Biology ........................................................................... 3
BIO 360 Animal Physiology .............................................................. 4
or MIC 360 Bacterial Physiology (3)
or PLB 308 Plant Physiology (4)
BIO 370 Vertebrate Zoology ............................................................... 4
or BIO 385 Comparative Invertebrate Zoology (4)
or MIC 206 Microbiology Laboratory SG* (1)
and MIC 220 Biology of Microorganisms (3)
or PLB 300 Comparative Plant Diversity L/SQ (4)

Total ........................................................................................................... 25 or 26

* Both MIC 205 and 206 must be taken to secure SG credit.
MIC 205 may not be substituted for MIC 220.

The remaining hours to bring the total to 45 will be selected from among relevant upper-division courses in BIO and PLB courses or in related departments, in consultation with a Department of Biology advisor. Required courses in related fields plus math proficiency are as follows:

CHM 113 General Chemistry SQ ......................................................... 4
CHM 115 General Chemistry with Qualitative Analysis SQ ........... 5
Choose between the combinations of organic chemistry
courses below ......................................................................................... 4 or 8
CHM 231 Elementary Organic Chemistry SQ (3)
CHM 235 Elementary Organic Chemistry Laboratory SQ (1)

CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)

MAT 210 Brief Calculus MA ................................................................. 3

or any calculus
Choose between the combinations of introduction
to physics courses below ......................................................................... 4

PHY 101 Introduction to Physics SQ (4)
or PHY 111 General Physics SQ (3)
PHY 112 General Physics SQ (3)
PHY 113 General Physics Laboratory SQ (1)
PHY 114 General Physics Laboratory SQ (1)

Total ........................................................................................................... 20 or 24

1 Both CHM 231 and 235 must be taken to secure SQ credit.
2 Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure SQ credit.

CONSERVATION BIOLOGY—B.S.

The major in Conservation Biology consists of a minimum of 45 semester hours in the required major courses and a minimum of 13 hours in related fields, plus a three-semester-hour mathematics proficiency. Required courses are as follows:

BIO 193 The Nature of Biological Science SQ ........................................... 4
or BIO 181 General Biology SQ (4)
and BIO 182 General Biology SG (4)
BIO 317 Conservation Biology ........................................................... 3
BIO 320 Fundamentals of Ecology ......................................................... 3
BIO 340 General Genetics ................................................................. 4
or BIO 341 Genetic Analysis (5)
BIO 360 Animal Physiology .............................................................. 4
BIO 410 Techniques in Wildlife Conservation Biology L ............... 3
BIO 411 Advanced Conservation Biology I ........................................... 3
BIO 412 Advanced Conservation Biology II ........................................... 3
BIO 415 Biometry CS ........................................................................... 4

Total ......................................................................................................... 31 or 32

The remaining hours to bring the total to 45 will be selected from among relevant upper-division courses in BIO and PLB courses or in related departments, in consultation with a Department of Biology advisor. Required courses in related fields plus math proficiency are as follows:

CHM 113 General Chemistry SQ ......................................................... 4
CHM 115 General Chemistry with Qualitative Analysis SQ ........... 5
Choose between the combinations of organic chemistry courses below ........................................ 4 or 8
CHM 231 Elementary Organic Chemistry SQ* (3)
CHM 235 Elementary Organic Chemistry Laboratory SQ* (1)

CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)
MAT 210 Brief Calculus MA..................................................3
or any calculus

Total ..................................................................................... 16 or 20

* Both CHM 231 and 235 must be taken to secure SQ credit.

Concentration in Biology and Society
The major in Biology with a concentration in biology and society is intended for students with a strong interest in life sciences and in the interaction between life sciences and the society within which science is done. This option consists of a minimum of 44 semester hours in life sciences and societal interface courses, and 12 hours in related fields, plus a three-semester-hour mathematics proficiency. Required courses are as follows:

BIO 193 The Nature of Biological Science SQ ..................... 4
or BIO 181 General Biology SQ (4)
and BIO 182 General Biology SQ (4)
BIO 311 Biology and Society .............................................. 3
BIO 320 Fundamentals of Ecology ....................................... 3
or BIO 345 Organic Evolution (3)
BIO 340 General Genetics .................................................. 4
or BIO 341 Genetic Analysis (5)
BIO 419 Research Colloquium in Biology and Society L.... 3
BIO 484 Internship ............................................................ 3
or BIO 493 Honors Thesis L/HU (3)
or BIO 495 Undergraduate Thesis (3)
or BIO 499 Individualized Instruction (3)
or approved hours in research (3)
MAT 210 Brief Calculus MA.................................................. 3
or any calculus

Total ..................................................................................... 23—24

The remaining courses to complete the major are determined by the student in consultation with a Department of Biology advisor and must be distributed in the following areas:

1. 12 hours of upper-division electives from BIO, MIC, PLB;
2. 12 hours of upper-division interface courses from an approved list. At least three semester hours in each of these areas: ethics, history and philosophy of science, and contemporary societal issues;
3. 11 hours of physical sciences (CHM recommended); and
4. three to four hours of an approved course in statistics.

MINOR IN BIOLOGY
The Biology minor consists of 24 semester hours, including BIO 193 The Nature of Biological Science or BIO 181

General Biology and BIO 182 General Biology, and 16 to 20 hours selected with approval of an advisor in the Department of Biology; at least 12 hours must be in the upper division. Courses not available for credit in the Life Sciences major (BIO, MBB, MIC, and PLB) cannot be used for the minor (e.g., BIO 100 The Living World and BIO 201 Human Anatomy and Physiology I). This minor is not available to students majoring in the life sciences.

SECONDARY EDUCATION—B.A.E.

Biological Sciences. The major teaching field consists of a minimum of 40 semester hours and at least 22 hours in supporting courses. Required major courses are as follows:

BIO 193 The Nature of Biological Science SQ ..................... 4
or BIO 181 General Biology SQ (4)
and BIO 182 General Biology SQ (4)
BIO 320 Fundamentals of Ecology ....................................... 3
BIO 340 General Genetics .................................................. 4
or BIO 341 Genetic Analysis (5)
BIO 345 Organic Evolution .................................................. 3
BIO 360 Animal Physiology .................................................. 4
BIO 370 Vertebrate Zoology .................................................. 4
or BIO 385 Comparative Invertebrate Zoology (4)
or PLB 300 Comparative Plant Diversity L/SQ (4)
or PLB 310 The Flora of Arizona (4)
MIC 206 Microbiology Laboratory SQ*.............................. 1
MIC 220 Biology of Microorganisms ...................................... 3
PLB 308 Plant Physiology .................................................... 4

Total ..................................................................................... 30 or 31

* Both MIC 205 and 206 must be taken to secure SG credit.

The remaining courses in the major (six hours minimum) should be selected to reflect a balance between BIO and PLB courses. Required supporting courses are as follows:

BIO 316 History of Biology: Conflicts and Controversies H ........ 3
or HPS 330 History of Biology: Conflicts and Controversies H (3)
CHM 113 General Chemistry SQ ............................................ 3
CHM 115 General Chemistry with Qualitative Analysis SQ ....... 4
GLG 102 Introduction to Geology II (Historical) SQ, H ......... 3
or GLG 300 Geology of Arizona (3)
MAT 170 Precalculus MA ..................................................... 3
PHY 101 Introduction to Physics SQ ....................................... 4
or PHY 111, 112 General Physics SQ 2 (6)
and PHY 113, 114 General Physics Laboratory SQ 2 (2)

Minimum total ........................................................................ 22

1 Both GLG 102 and 104 must be taken to secure SG credit.
2 Both PHY 111 and 112 or PHY 112 and 114 must be taken to secure SQ credit.

BIO 480 Methods of Teaching Biology and BIO 482 Advanced Methods of Teaching Biology are required in the professional education program.

The minor teaching field consists of 24 semester hours as follows: BIO 181, 182; 16 additional hours in BIO, MIC, and PLB courses selected to reflect a balance across the disciplines and subdisciplines in biology. BIO 480 is
required in addition to the 24 semester hours in biological sciences.

**GRADUATE PROGRAM**

The faculty in the Department of Biology offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. (with a concentration in ecology for the M.S. and the Ph.D.). See the *Graduate Catalog* for requirements.

The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. See the *Graduate Catalog* for more information.

**BIOLOGY (BIO)**

**BIO 100 The Living World. (4)**
fall, spring, summer
Principles of biology. Cannot be used for major credit in the biological sciences. 3 hours lecture, 3 hours lab.
General Studies: SQ

**BIO 120 Human Physiology. (4)**
not regularly offered
Basic concepts of general science are discussed using current issues and basic concepts of human physiology as a focus. Cannot be used for major credit in biological sciences. 3 hours lecture, 3 hours lab.
General Studies: SQ

**BIO 181 General Biology. (4)**
fall, spring, summer
Biological concepts emphasizing fundamental principles and the interplay of structure and function at the molecular, cellular, organismal, and population levels of organization. Secondary school chemistry strongly recommended. 3 hours lecture, 3 hours lab. Prerequisite: biological sciences major or preprofessional student in health-related sciences.
General Studies: SQ

**BIO 182 General Biology. (4)**
fall, spring, summer
Continuation of BIO 181. Secondary school chemistry strongly recommended. Fee. Prerequisite: BIO 181.
General Studies: SQ

**BIO 193 The Nature of Biological Science. (4)**
not regularly offered
Creative and critical thinking skills in biological research; nature of biological knowledge; role of experimentation, predictions, hypotheses, theories, values. Lecture, lab, discussion. Fee. Prerequisite: high school biology.
General Studies: SQ

**BIO 201 Human Anatomy and Physiology I. (4)**
fall, spring, summer
Structure and dynamics of the human mechanism. Cannot be used for major credit in the Department of Biology. 3 hours lecture, 3 hours lab.
General Studies: SG

**BIO 202 Human Anatomy and Physiology II. (4)**
fall, spring, summer
Continuation of BIO 201. Cannot be used for major credit in the Department of Biology. 3 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 201 or instructor approval.

**BIO 218 Medical History. (1)**
not regularly offered
Brief survey of humankind's important inventions and discoveries in the art and science of medicine, illustrating interrelationships of medical ideas.

**BIO 241 Human Genetics. (4)**
fall
Introduction to basic concepts in genetics as they are applied to human heredity. Cannot be used for major credit in the Department of Biology. 3 hours lecture, 3 hours lab. Prerequisite: a course in the life sciences.
General Studies: SG

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

**BIO 301 Field Natural History. (1)**
not regularly offered
Organisms and their natural environment. 2 weekend field trips, field project. Cannot be used for major credit in the biological sciences. Fee. Pre- or corequisite: BIO 300.

**BIO 302 Cancer and Heart Disease. (3)**
fall
Incidence and mortality statistics for cancer and heart disease; host and environmental risk factors; diagnosis, treatment and prevention strategies. Cannot be counted toward a Biology major. Prerequisites: a combination of CHM 231 (or its equivalent) and 12 hours in life sciences and a General Studies L course or only instructor approval.
General Studies: L

**BIO 303 Radiation and Life. (3)**
spring
Benefits and risks of radiation exposure in society; medical applications, food irradiation, nuclear power, solar UV, population health effects. Cannot be counted toward a Biology major. Prerequisites: a combination of CHM 231 (or its equivalent) and 12 hours in life sciences and a General Studies L course or only instructor approval.
General Studies: L

**BIO 304 Radiation Medicine and Biology. (3)**
fall
Uses of radiation in medicine, including CT, diagnostic X-ray, MRI, nuclear medicine, ultrasound; biological effects of radiation with emphasis on cancer. Prerequisites: a combination of PHY 112 and 12 hours in life sciences and a General Studies L course or only instructor approval.
General Studies: L

**BIO 310 Special Problems and Techniques. (1–3)**
fall and spring
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 department chair.

**BIO 311 Biology and Society. (3)**
spring
Explores interactions between biological sciences and society, e.g., biomedical, environmental, ethical, historical, legal, philosophical, political, and social issues. Lecture, discussion. Prerequisites: both BIO 181 and 182 or only BIO 193 (or 100).

**BIO 316 History of Biology: Conflicts and Controversies. (3)**
not regularly offered
Focuses on 19th and 20th centuries, considering biology as a discipline. Evolution, problems of heredity, development, and cell theory. Cross-listed as HPS 330. Credit is allowed for only BIO 316 or HPS 330.
General Studies: L

**BIO 317 Conservation Biology. (3)**
fall
Scientific and technical means for management, maintenance, protection, and restoration of biological resources on this planet. Prerequisite: 8 hours in biology.

**BIO 318 History of Medicine. (3)**
fall
Scientific study of the human body, changing theories of disease, evolution of practical opinions on treatment, and the emerging institutionalization of medical practice. Cross-listed as HPS 331. Credit is allowed for only BIO 318 or HPS 331.
General Studies: L

**BIO 319 Environmental Science (Nonmajor). (3)**
fall
Environmental and biological concepts used to understand ecological systems with specific references to problems caused by humans. Cannot be used for major credit in the biological sciences. Cross-listed as PLB 320. Credit is allowed for only BIO 319 or PLB 320.
General Studies: G

**BIO 320 Fundamentals of Ecology. (3)**
fall and spring
Organization, functioning, and development of ecological systems; energy flow; biogeochemical cycling; environmental relations; population dynamics. Prerequisite: BIO 182 or instructor approval.
BIO 321 Introductory Ecology Laboratory. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.  
General Studies: L

BIO 331 Animal Behavior. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 336 Sociology. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 341 Genetic Analysis. (5)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 343 Genetic Engineering and Society. (4)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 344 Origins, Evolution, and Creation. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 345 Organic Evolution. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 346 The Darwinian Revolution. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 351 Developmental Anatomy. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 352 Laboratory in Vertebrate Developmental Anatomy. (2)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 353 Cell Biology. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 360 Animal Physiology. (4)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 370 Vertebrate Zoology. (4)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 385 Comparative Vertebrate Zoology. (4)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 386 General Entomology. (4)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 394 Special Topics. (2–3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 401 General Studies: L  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 406 Computer Applications in Biology. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 411 Advanced Conservation Biology I. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 412 Advanced Conservation Biology II. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 415 Biometry. (4)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 416 Professional Values in Science. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 419 Research Colloquium in Biology and Society. (3–6)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.

BIO 420 Field Zoology. (3)  
Lab. 3 hours. Fees. Prerequisites: BIO 182.
BIO 423 Population and Community Ecology. (3)  
not regularly offered  
Organization and dynamics of population and communities, emphasizing animals. Theoretical and empirical approaches. Prerequisite: BIO 320 or instructor approval.

BIO 424 Mathematical Models in Ecology. (4)  
not regularly offered  
Mathematical modeling of populations, communities, and ecosystems, including case studies and student-designed projects. 3 hours lecture, 3 hours lab. Prerequisites: BIO 320; any calculus course.

BIO 425 Animal Ecology. (3)  
not regularly offered  
Physiological and behavioral adaptations of individual animals to both abiotic and biotic environments. Prerequisite: BIO 320.

BIO 426 Limnology. (4)  
not regularly offered  
Structure and function of aquatic ecosystems, with emphasis on freshwater lakes and streams. 3 hours lecture, 3 hours lab and field trip. Fee. Prerequisite: BIO 320 or instructor approval.  
General Studies: L

BIO 427 Fire. (3)  
spring in odd years  
Interdisciplinary survey of fire on Earth—its history, ecology, and management. Prerequisite: BIO 182.

BIO 428 Biogeography. (3)  
fall  
Environmental and historical processes determining distributional patterns of animals and plants, emphasizing terrestrial life. Prerequisites: BIO 182 (or its equivalent); junior standing.  
General Studies: L

BIO 431 Human Development and Fertility. (3)  
not regularly offered  
Global influences of human population development on the human environment, including understanding human fertility and clinical influences on fertility. Discussion, presentation. Prerequisite: general biology.

BIO 435 Research Techniques in Animal Behavior. (3)  
not regularly offered  
Experimental and field studies of animal behavior; description and quantification of animal behavior and interpretation of behavior within an evolutionary framework. 1 hour lecture, 6 hours lab. Prerequisite: BIO 331.  
General Studies: L

BIO 441 Cytogenetics. (3)  
not regularly offered  
Chromosomal basis of inheritance. Cross-listed as PLB 412. Credit is allowed for only BIO 441 or PLB 412. Prerequisite: BIO 340.

BIO 442 Cytogenetics Laboratory. (2)  
not regularly offered  
Microscopic analysis of meiosis, mitosis, and aberrant cell division. 6 hours lab. Cross-listed as PLB 413. Credit is allowed for only BIO 442 or PLB 413. Pre- or corequisite: BIO 441 or PLB 412.

BIO 446 Principles of Human Genetics. (3)  
fall  
Molecular and cellular analysis of the human genome. Prerequisite: BIO 340.  
General Studies: L

BIO 450 Advanced Developmental Biology. (3)  
spring  
Current concepts and experimental methods involving differentiation and biosynthetic activities of cells and organisms, with examples from microorganisms, plants, and animals. Prerequisite: BIO 351.

BIO 453 Animal Histology. (4)  
fall  
Microscopic study of animal tissues. 3 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 182 or instructor approval.

BIO 454 Aquatic Insects. (3)  
not regularly offered  
Systematics and ecology of aquatic insects. Prerequisite: BIO 386.

BIO 464 Photobiology. (3)  
not regularly offered  
Principles underlying the effects of light on growth, development, and behavior of plants, animals, and microorganisms. Cross-listed as PLB 440. Credit is allowed for only BIO 464 or PLB 440. Prerequisites: CHM 231 (or 331); 12 hours in life sciences.
BIO 508 Scientific Data Presentation. (2)  
Spring  
Techniques necessary for presentation of scientific data used in journal publications, grant proposals, and visual presentations. Lecture, lab. Prerequisite: instructor approval.  

BIO 520 Biology of the Desert. (2)  
Not regularly offered  
Factors affecting plant and animal life in the desert regions and adaptations of the organisms to these factors. Prerequisite: 10 hours in biological sciences or instructor approval.  

BIO 522 Populations: Evolutionary Ecology. (3)  
Not regularly offered  
Principles of population biology and community ecology within an evolutionary framework. 2 hours lecture, 2 hours recitation. Prerequisites: BIO 320, 415 (or MAT 210), 545.  

BIO 524 Ecosystems. (3)  
Not regularly offered  
Recent literature, developments, methods, and limnological theory; field and lab application to some particular topic in limnology. Prerequisite: BIO 426.  

BIO 526 Quantitative Ecology. (3)  
Not regularly offered  
Sampling strategies, spatial pattern analysis, species diversity, classification, and applications of multivariate techniques to ecology; 2 hours lecture, 3 hours lab. Prerequisites: BIO 415 (or its equivalent); a course in ecology.  

BIO 529 Advanced Limnology. (3)  
Not regularly offered  
Recent literature, developments, methods, and limnological theory; field and lab application to some particular topic in limnology. Prerequisite: BIO 426.  

BIO 532 Populations: Evolutionary Genetics. (3)  
Not regularly offered  
Mathematical models in the description and analysis of the genetics of populations. Prerequisites: a combination of BIO 320 and 345 and 415 or only instructor approval.  

BIO 545 Populations: Evolutionary Genetics. (3)  
Not regularly offered  
Mathematical models in the description and analysis of the genetics of populations. Prerequisites: a combination of BIO 320 and 345 and 415 or only instructor approval.  

BIO 547 Techniques in Evolutionary Genetics. (4)  
Not regularly offered  
Practical experience in modern techniques for the study of evolution. Lecture, lab. Prerequisites: BIO 340, 345; instructor approval.  

BIO 550 Advanced Cell Biology. (3)  
Spring  
Applications of contemporary electron microscopic and biochemical/molecular techniques for studying eukaryotic cell functions. Mechanisms of intracellular protein trafficking. Prerequisites: BIO 353 (or 360 or its equivalent or PLB 353); CHM 231 (or 331 or its equivalent).  

BIO 551 Biomembranes. (3)  
Not regularly offered  
Structure and function of biological membranes, emphasizing synthesis, fluidity, exocytosis, endocytosis, and cell responses to hormones and neurotransmitters. Prerequisites: BIO 353 (or its equivalent); CHM 231 (or 331 or its equivalent).  

BIO 552 Developmental Genetics. (3)  
Spring  
Genetic approaches to the analysis of development during the life cycle of eukaryotic organisms, and the role of genes in the unfolding of the differentiated phenotype. Prerequisite: BIO 340.  

BIO 556 Comparative Physiology. (3)  
Not regularly offered  
Analysis of function in invertebrates and vertebrates, emphasizing evolutionary trends in physiological systems. Prerequisite: BIO 360 (or its equivalent).  

BIO 558 Mammalian Physiology. (3)  
Not regularly offered  
Detailed treatment of mammalian organ system functions emphasizing integrative mechanisms. Prerequisite: BIO 360 (or its equivalent).  

BIO 569 Cellular Physiology. (3)  
Not regularly offered  
Emphasizes the molecular basis for cell structure and function. Prerequisite: BIO 360; a course in organic chemistry.  

BIO 583 OTS: Fieldwork in Tropical Biology. (6–8)  
Spring and summer  
Intensive field-oriented classes with Organization for Tropical Studies (OTS) in Costa Rica with emphasis on research in ecology and systematics. Lecture, lab, fieldwork. Cross-listed as PLB 583. Credit is allowed for only BIO 583 or PLB 583. Prerequisites: graduate standing; a course in basic ecology.  

BIO 584 Internship. (1–12)  
Fall and spring  

BIO 591 Seminar. (1–12)  
Fall and spring  
May be repeated for credit. Possible topics:  
(a) Adaptations. (1–3)  
(b) Behavior. (1–3)  
(c) Cell Biology. (1–3)  
(d) Ecology. (1–3)  
(e) Evolution. (1–3)  
(f) Genetic Engineering. (1–3)  
(g) Genetics. (1–3)  
(h) Physiology. (1–3)  

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REGENTS’ PROFESSORS  
ANGELL, BUSECK, MAYER, C. MOORE, O’KEEFFE, PETTIT  

PROFESSORS  
ALLEN, BIEBER, BIRK, BLANKENSHIP, FUCHS, GLAUNSINGER, GLICK, GUST, HOLLOWAY, LOHR, A. MOORE, T. MOORE, MUNK, PETUSKEY, ROSE, SKIBO, STEIMLE, WILLIAMS, WOODBURY  

ASSOCIATE PROFESSORS  
KOVETAKIS, WOLF  

ASSISTANT PROFESSORS  
BOOKSH, CAUDLE, FRANCISCO, GOULD, HAYES, MATYUSHOV, RICHERT  

SENIOR LECTURERS  
BEDGOOD, WHITE  

LECTURER  
BAUER  

CHEMISTRY—B.A.  
The B.A. degree in Chemistry consists of 46 semester hours. Required courses are as follows:  

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
Choose between the course combinations below........................... 9 or 8

CHM 113 General Chemistry SQ (4)
CHM 115 General Chemistry with Qualitative Analysis SQ (5)

or

CHM 117 General Chemistry for Majors I SQ* (4)
CHM 118 General Chemistry for Majors II SQ* (4)

Choose between the course combinations below........................... 8

CHM 317 Organic Chemistry for Majors I* (3)
CHM 318 Organic Chemistry for Majors II* (3)
CHM 319 Organic Chemistry Laboratory for Majors I* (1)
CHM 320 Organic Chemistry Laboratory for Majors II* (1)

or

CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)

CHM 325 Analytical Chemistry .................................................... 3
CHM 326 Analytical Chemistry Laboratory ..................................... 1
CHM 341 Elementary Physical Chemistry ...................................... 3
CHM 343 Physical Chemistry Laboratory ...................................... 1
CHM 453 Inorganic Chemistry ..................................................... 3
CHM electives............................................................................... 2

Minimum total ............................................................................. 30

* CHM 117, 118, 317, 318, 319, and 320 are strongly recommended for qualified students.

Related courses must include the following:

MAT 270 Calculus with Analytic Geometry I MA 1 ........................ 4
MAT 271 Calculus with Analytic Geometry II MA 1 ...................... 4
PHY 111 General Physics SQ 2 .......................... 3
PHY 112 General Physics SQ 2 .......................... 3
PHY 113 General Physics Laboratory SQ 2 .............................. 1
PHY 114 General Physics Laboratory SQ 2 .............................. 1

Total .......................................................................................... 16

1 Equivalents may be taken in place of MAT 270 and 271.
2 More advanced PHY courses may be taken in place of PHY 111, 112, 113, and 114.
3 Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure SQ credit.

The remaining courses to complete the major are determined by students in consultation with their advisors.

CHEMISTRY—B.S.

The program consists of 45 semester hours in chemistry and 20 hours of related courses outside the major. Required courses are as follows:

CHM 113 General Chemistry SQ (4)
CHM 115 General Chemistry with Qualitative Analysis SQ (5)

CHM 117 General Chemistry for Majors I SQ* (4)
CHM 118 General Chemistry for Majors II SQ* (4)

CHM 317 Organic Chemistry for Majors I* (3)
CHM 318 Organic Chemistry for Majors II* (3)
CHM 319 Organic Chemistry Laboratory for Majors I* (1)
CHM 320 Organic Chemistry Laboratory for Majors II* (1)

CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)

Total .......................................................................................... 16 or 17

* CHM 117, 118, 317, 318, 319, and 320 are strongly recommended for qualified students.

Additional required chemistry courses are as follows:

CHM 249 Introduction to Physical Chemistry 1 ......................... 3
CHM 325 Analytical Chemistry ................................................. 3
CHM 326 Analytical Chemistry Laboratory ................................ 1
CHM 327 Instrumental Analysis.................................................. 3
CHM 328 Instrumental Analysis Laboratory ............................... 2
CHM 345 Physical Chemistry I 2 .............................................. 3
CHM 346 Physical Chemistry II 2 ............................................. 3
CHM 348 Physical Chemistry Laboratory I L 2 ............................. 1
CHM 349 Physical Chemistry Laboratory II L 2 ......................... 1
CHM 452 Inorganic Chemistry Laboratory L 2 ......................... 1
CHM 453 Inorganic Chemistry .................................................. 3
CHM 460 Biological Chemistry .................................................. 3
Chemistry elective (choose from the courses below) .................. 2

CHM 392 Introduction to Research Techniques (1–3)
CHM 424 Separation Science (3)
CHM 431 Qualitative Organic Analysis (3)
CHM 471 Solid-State Chemistry (3)
CHM 480 Methods of Teaching Chemistry (3)
CHM 481 Geochemistry (3)
CHM 485 Meteorites and Cosmochemistry (3)

Total .......................................................................................... 29

1 Completion of MAT 274 and 342 satisfies the CHM 249 requirement.
2 CHM 348, 349, and 452 must all be taken to secure L credit.

Additional required related field courses are as follows:

MAT 270 Calculus with Analytic Geometry I MA ........................ 4
MAT 271 Calculus with Analytic Geometry II MA ...................... 4
MAT 272 Calculus with Analytic Geometry III MA ..................... 4
PHY 121 University Physics I: Mechanics SQ 1 ............................ 3
PHY 122 University Physics Laboratory I SQ 1 .......................... 1
PHY 131 University Physics II: Electricity and Magnetism SQ 2 .......................... 3
PHY 132 University Physics Laboratory II SQ 2 ......................... 1

Total .......................................................................................... 20

1 Both PHY 121 and 122 must be taken to secure SQ credit.
2 Both PHY 131 and 132 must be taken to secure SQ credit.

A course in a computer language, such as CSE 181 Applied Problem Solving with Visual BASIC or CSE 183 Applied Problem Solving with FORTRAN is strongly recommended.

Transfer students are interviewed and advised of possible preparatory work. They must contact the department to arrange for the interview in advance of registration. See “College Degree Requirements,” page 319.

American Chemical Society Certification. A student who successfully completes the B.S. in Chemistry program is certified by the Department of Chemistry and Biochemistry to the American Chemical Society (ACS) as having met the specific requirements for undergraduate professional train-
ing in chemistry. Graduates meeting ACS guidelines can receive a certificate to indicate this fact.

**BIOCHEMISTRY—B.S.**

The program consists of 36 semester hours in chemistry and 27 semester hours of related courses. Required courses are as follows:

Choose between the course combinations below .......................... 9 or 8
CHM 113 General Chemistry \( SQ^1 \) (4)
CHM 115 General Chemistry with Qualitative Analysis \( SQ^1 \) (5)

--- or ---
CHM 113 General Chemistry \( SQ^1 \) (4)
CHM 116 General Chemistry \( SQ^1 \) (4)

CHM 117 General Chemistry for Majors I \( SQ^1 \) (4)
CHM 118 General Chemistry for Majors II \( SQ^1 \) (4)
Choose between the combinations of courses below ...................... 8
CHM 317 Organic Chemistry for Majors I* (3)
CHM 318 Organic Chemistry for Majors II* (3)
CHM 319 Organic Chemistry Laboratory for Majors I* (1)
CHM 320 Organic Chemistry Laboratory for Majors II* (1)

--- or ---
CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)

Total ..................................................................................... 16 or 17

* CHM 117, 118, 317, 318, 319, and 320 are strongly recommended for qualified students.

Additional required chemistry courses are as follows:

BCH 461 General Biochemistry ......................................... 3
BCH 462 General Biochemistry ......................................... 3
BCH 463 Biophysical Chemistry ....................................... 3
BCH 464 Biophysical Chemistry Laboratory ................... 2
BCH 467 Analytical Biochemistry Laboratory L .............. 3
CHM 341 Elementary Physical Chemistry* ....................... 3
Chemistry elective (choose from the courses below) ......... 3
BCH 494 ST: Topics in Nucleic Acids Biochemistry (2)
BCH 494 ST: Topics in Protein Biochemistry (2)
CHM 327 Instrumental Analysis (3)
CHM 424 Separation Science (3)
CHM 431 Qualitative Organic Analysis (3)
CHM 453 Inorganic Chemistry (3)
CHM 471 Solid-State Chemistry (3)

Total ...................................................................................... 20

* CHM 345 may be taken in place of CHM 341.

Additional required related field courses are as follows:

BIO 193 The Nature of Biological Science \( SQ^1 \) ................. 4
BIO 340 General Genetics ............................................... 4
BIO 353 Cell Biology ......................................................... 3
MAT 270 Calculus with Analytic Geometry I \( MA^1 \) ........... 4
MAT 271 Calculus with Analytic Geometry II \( MA^1 \) ....... 4
PHY 121 University Physics I: Mechanics \( SQ^1 \) .............. 3
PHY 122 University Physics Laboratory I \( SQ^1 \) ............. 1
PHY 131 University Physics II: Electricity and Magnetism \( SQ^2 \) 3

PHY 132 University Physics Laboratory II \( SQ^2 \) .............. 1
Total ...................................................................................... 27

1 Both PHY 121 and 122 must be taken to secure SQ credit.
2 Both PHY 131 and 132 must be taken to secure SQ credit.

Additional biology courses selected from BIO 343, 351, 360, 441, 450, and 465 are strongly recommended. Other biology courses may be substituted.

Additional biochemistry and chemistry courses, including CHM 392 Introduction to Research Techniques, may be taken by students and should be chosen in consultation with an advisor.

**MINOR IN CHEMISTRY**

A minor in Chemistry is awarded to students who complete the following required courses:

CHM 113 General Chemistry \( SQ^1 \) ........................................ 4
CHM 115 General Chemistry with Qualitative Analysis \( SQ^1 \) (4)
or CHM 116 General Chemistry \( SQ^1 \) (4)
CHM 325 Analytical Chemistry ............................................. 3
CHM 326 Analytical Chemistry Laboratory ........................ 1
Choose between the course combinations below ...................... 8
BCH 361 Principles of Biochemistry (3)
BCH 367 Elementary Biochemistry Laboratory (1)
CHM 231 Elementary Organic Chemistry \( SQ^2 \) (3)
CHM 235 Elementary Organic Chemistry Laboratory \( SQ^2 \) (1)

--- or ---
CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)

Choose between the course combinations below ..................... 4 or 8
CHM 341 Elementary Physical Chemistry (3)
CHM 343 Physical Chemistry Laboratory (1)

--- or ---
CHM 345 Physical Chemistry I (3)
CHM 346 Physical Chemistry II (3)
CHM 348 Physical Chemistry Laboratory I (1)
CHM 349 Physical Chemistry Laboratory II (1)

Minimum total ......................................................................... 24

1 Equivalent courses may be taken in place of CHM 113, 115, or 116.
2 Both CHM 231 and 235 must be taken to secure SQ credit.

**SECONDARY EDUCATION—B.A.E.**

**Chemistry.** Students may pursue one of two options for the chemistry major teaching field.

**Option One.** The academic specialization consists of 43 semester hours in chemistry plus work in related fields.

Required courses are as follows:

BCH 361 Principles of Biochemistry ........................................ 3
CHM 113 General Chemistry \( SQ^1 \) ........................................ 4
CHM 115 General Chemistry with Qualitative Analysis \( SQ^1 \) (5)
CHM 325 Analytical Chemistry ............................................. 3
CHM 326 Analytical Chemistry Laboratory ........................ 1
CHM 331 General Organic Chemistry .................................. 3
CHM 332 General Organic Chemistry ................................. 3

--- or ---
CHM 341 Elementary Physical Chemistry (3)
CHM 343 Physical Chemistry Laboratory (1)

--- or ---
CHM 345 Physical Chemistry I (3)
CHM 346 Physical Chemistry II (3)
CHM 348 Physical Chemistry Laboratory I (1)
CHM 349 Physical Chemistry Laboratory II (1)

Minimum total ......................................................................... 24

1 Equivalent courses may be taken in place of CHM 113, 115, or 116.
2 Both CHM 231 and 235 must be taken to secure SQ credit.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
CHM 335 General Organic Chemistry Laboratory..........................1
CHM 336 General Organic Chemistry Laboratory..........................1
CHM 341 Elementary Physical Chemistry.................................3
   or CHM 345 Physical Chemistry I (3)
   and CHM 346 Physical Chemistry II (3)

Total ...............................................................................................3

The remaining chemistry courses to complete the specialization are determined by students in consultation with their advisors.

Additional required related field courses are as follows:

MAT 270 Calculus with Analytic Geometry I MA .....................4
MAT 271 Calculus with Analytic Geometry II MA ...................4
PHY 111 General Physics SQ* ....................................................3
PHY 112 General Physics SQ* ....................................................3
PHY 113 General Physics Laboratory SQ* ..............................1
PHY 114 General Physics Laboratory SQ* ..............................1

Total ...............................................................................................16

* Both PHY 111 or 113 or PHY 112 and 114 must be taken to secure SQ credit.

**Option Two.** The academic specialization consists of 30 semester hours of chemistry, which includes all of the required chemistry courses listed in option one 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.

**Minor Teaching Field.** The minor teaching field consists of the following required courses:

CHM 113 General Chemistry SQ ............................................4
CHM 115 General Chemistry with Qualitative Analysis SQ ..........5
Choose between the course combinations below.........................10 or 8
   BCH 361 Principles of Biochemistry (3)
CHM 231 Elementary Organic Chemistry SQ* (3)
CHM 325 Analytical Chemistry (3)
CHM 326 Analytical Chemistry Laboratory (1)
   or

   CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)
CHM 341 Elementary Physical Chemistry ..............................3

Total ...............................................................................................20 or 22

* Both CHM 231 and 235 must be taken to secure SQ credit.

The remaining courses to complete the specialization are determined by students in consultation with their advisors.

**GRADUATE PROGRAMS**

The faculty in the Department of Chemistry and Biochemistry offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. See the Graduate Catalog for requirements.

The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. For more information, visit the program office in LSE 411, or call 480/965-0743.

**BIOCHEMISTRY (BCH)**

**BCH 361 Principles of Biochemistry. (3)**
   **Fall and summer**
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. Credit is allowed for only BCH 361 or 461. Prerequisite: CHM 231 or 318 or 332.

**BCH 367 Elementary Biochemistry Laboratory. (1)**
   **Fall and summer**
Qualitative/quantitative analyses of constituents of biological systems, enzyme activity measurements and metabolic studies. 1 hour conference, 3 hours lab. Pre- or corequisite: BCH 361 or instructor approval.

**BCH 392 Introduction to Research Techniques. (1–3)**
   **Fall, spring, summer**
Instrumental methods and philosophy of research by actual participation in chemical research projects. May be repeated for total of 6 semester hours. Prerequisite: advisor and research supervisor approval.

**BCH 461 General Biochemistry. (3)**
   **Fall**
Structure, chemistry, and metabolism of biomolecules and their role in the biochemical processes of living organisms. Credit is allowed for only BCH 461 or 361. Prerequisite: CHM 318 or 332. Corequisite: CHM 341 or 346.

**BCH 462 General Biochemistry. (3)**
   **Spring**
Continuation of BCH 461. Prerequisite: BCH 461 or instructor approval.

**BCH 463 Biophysical Chemistry. (3)**
   **Fall**
Principles of physical chemistry as applied to biological systems. Prerequisite: CHM 341 or 346.

**BCH 464 Biophysical Chemistry Laboratory. (2)**
   **Fall**
Introduction to physical methods in modern biochemistry. Prerequisite: BCH 463.

**BCH 467 Analytical Biochemistry Laboratory. (3)**
   **Spring**
Quantitative analysis, separation and purification of biological molecules. Application of chemical and physical methods to the characterization of biological macromolecules. 1 conference, 1 hour lecture, 5 hours lab. Prerequisite: BCH 461. Corequisite: BCH 462.

**General Studies:**

**BCH 494 Special Topics. (1–4)**
   **Not regularly offered**
Possible topics:
   (a) Topics in Nucleic Acids Biochemistry. (2)
   (b) Topics in Protein Biochemistry. (2)

**BCH 501 Current Topics in Biochemistry. (1)**
   **Fall and spring**
May be repeated for credit. Seminar. Prerequisite: instructor approval.

**BCH 561 Advanced Topics in Biochemistry. (3)**
   **Spring**
Topics selected from emerging areas of biochemistry based primarily on current literature. Prerequisite: BCH 462.

**BCH 563 Biophysical Chemistry. (3)**
   **Not regularly offered**
Physical chemistry of macromolecules, especially proteins, nucleic acids, and polysaccharides. Thermodynamics, hydrodynamics, and spectroscopy of and their relation to structure. Prerequisites: BCH 462; CHM 346.

**BCH 568 Molecular Mechanisms of Photosynthesis. (3)**
   **Spring**
Structure and function of photosynthetic complexes; mechanism of energy conversion in plants, bacteria, and model systems. Cross-listed as PLB 558. Credit is allowed for only BCH 568 or PLB 558. Prerequisite: instructor approval.
CHEMISTRY (CHM)

CHM 101 Introductory Chemistry. (4)
fall, spring, summer
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. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. General Studies: SQ

CHM 107 Chemistry and Society. (4)
fall and spring
General chemical principles and concepts presented in context of social and technological issues, e.g., energy, pollution, global warming, and others. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. General Studies: SQ

CHM 113 General Chemistry. (4)
fall and spring
Principles of chemistry. Adapted to the needs of students in the physical, biological, and earth sciences. 1 year of high school chemistry recommended. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. Prerequisites: MAT 106 (or 3 semesters of high school algebra). General Studies: SQ

CHM 114 General Chemistry for Engineers. (4)
fall and spring
One semester college chemistry with emphasis toward engineering. Students without high school chemistry or chemical engineering majors must enroll in the CHM 113, 116 sequence instead of CHM 114. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117 and for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. Prerequisites: CHM 113 or 2 years of high school chemistry. General Studies: SQ

CHM 115 General Chemistry with Qualitative Analysis. (5)
fall, spring, summer
Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals, and metalloids and the introduction to organic chemistry. Laboratory includes qualitative analysis. Credit is allowed for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 2 hours discussion, 4 hours lab. Fee. Prerequisite: CHM 113 or 2 years of high school chemistry. General Studies: SQ

CHM 116 General Chemistry. (4)
fall and spring
Continuation of CHM 113. Equilibrium theory, chemistry of metals, nonmetals, and metalloids and the introduction to organic chemistry. Credit is allowed for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 1 hour discussion, 2 hours lab. Fee. Prerequisite: CHM 113 or 2 years of high school chemistry. General Studies: SQ

CHM 117 General Chemistry for Majors I. (4)
fall
Atomic and molecular structure, properties and physical states of matter, thermodynamics, kinetics, acids and bases, chemical analysis, and stoichiometry. Credit is allowed for only CHM 101 or 107 or 113 or 114 or 117. 3 hours lecture, 1 conference, 2 hours lab. Fee. Prerequisites: 3 years of high school mathematics; minimum of 1 year of high school physics. Prerequisite with a grade of "B" or higher: minimum of 1 year of high school chemistry. General Studies: SQ

CHM 118 General Chemistry for Majors II. (4)
spring
Continuation of CHM 117. Credit is allowed for only CHM 114 or 115 or 116 or 118. 3 hours lecture, 1 conference, 2 hours lab. Fee. Prerequisite: CHM 117. Corequisite: MAT 270. General Studies: SQ

CHM 211 Elementary Organic Chemistry. (3)
fall and spring
Survey of organic chemistry, with emphasis on the reactivity of basic functional groups. Credit is allowed for only CHM 231 or 317 or 331. Prerequisite with a grade of "B" or higher: CHM 101 or 114 or 115 or 116 or 117 or 1 year of high school chemistry or instructor approval. General Studies: SQ (if credit also earned in CHM 235)

CHM 235 Elementary Organic Chemistry Laboratory. (1)
fall and spring
Organic chemistry experiments in synthesis, purification, analysis, and identification. Lab. Fee. Pre- or corequisite: CHM 231. General Studies: SQ (if credit also earned in CHM 231)

CHM 240 Introduction to Physical Chemistry. (3)
spring
Introduces mathematical/computational methods in chemical kinetics, thermodynamics, quantum chemistry. Mathematical-based computer laboratory. 2 hours lecture, 4 hours lab. Prerequisite with a grade of "C" or higher: MAT 272.

CHM 302 Environmental Chemistry. (3)
spring
Explores major environmental issues, problems, and solutions from analytical and chemistry perspectives. Prerequisites: CHM 114 or 115 or 116 or 118, 231 (or 331).

CHM 317 Organic Chemistry for Majors I. (3)
fall
Structures, reaction mechanisms and kinetics, and systematic synthesis of organic compounds. Credit is allowed for only CHM 231 or 317 or 331. Prerequisite: CHM 115 or 118. Corequisite: CHM 319.

CHM 318 Organic Chemistry for Majors II. (3)
spring
Continuation of CHM 317. Credit is allowed for only CHM 318 or 332. Prerequisite: CHM 317. Corequisite: CHM 320.

CHM 319 Organic Chemistry Laboratory for Majors I. (1)
fall
Experiments in organic chemistry and laboratory techniques. Credit is allowed for only CHM 319 or 335. 1 conference, 1 hour lab. Fee. Pre- or corequisite: CHM 317.

CHM 320 Organic Chemistry Laboratory for Majors II. (1)
spring
Continuation of CHM 319. Credit is allowed for only CHM 320 or 336. 1 conference, 3 hours lab. Fee. Prerequisite: CHM 319. Corequisite: CHM 318.

CHM 325 Analytical Chemistry. (3)
fall and summer
Principles and methods of chemical analysis. Prerequisite: CHM 115 or 116.

CHM 326 Analytical Chemistry Laboratory. (1)
fall and summer
Experiments in chemical analysis. 4 hours lab. Fee. Corequisite: CHM 325.

CHM 327 Instrumental Analysis. (3)
spring
Principles of instrumental methods in chemical analysis. Electroanalytical and optical techniques. Prerequisites: CHM 325, 326. Pre- or corequisite: CHM 346.

CHM 328 Instrumental Analysis Laboratory. (2)
spring
Experiments in chemical analysis by electroanalytical and optical techniques. 6 hours lab. Fee. Corequisite: CHM 327.

CHM 331 General Organic Chemistry. (3)
fall, spring, summer
Chemistry of organic compounds. Credit is allowed for only CHM 231 or 317 or 331. Prerequisite: CHM 115 or 116 or 118.

CHM 332 General Organic Chemistry. (3)
fall, spring, summer
Continuation of CHM 331. Credit is allowed for only CHM 318 or 332. Prerequisite: CHM 331.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
CHM 335 General Organic Chemistry Laboratory. (1)
fall, spring, summer
Microscale organic chemical experiments in separation techniques, synthesis, analysis and identification, and relative reactivity. Credit is allowed for only CHM 319 or 335. 4 hours lab. Fee. Corequisite: CHM 331.

CHM 336 General Organic Chemistry Laboratory. (1)
fall, spring, summer
Continuation of CHM 335. Credit is allowed for only CHM 320 or 336. 4 hours lab. Fee. Prerequisite: CHM 335. Corequisite: CHM 332.

CHM 341 Elementary Physical Chemistry. (3)
fall
Thermodynamics, equilibrium, states of matter, solutions, and chemical kinetics. For students in premedical, biological, and educational curricula. Prerequisites: CHM 115 (or 114 or 118 or 325), 231 (or 331); MAT 271; PHY 112.

CHM 343 Physical Chemistry Laboratory. (1)
fall
Physical chemistry experiments. Credit is allowed for only CHM 343 or both CHM 348 and 349. 1 hour conference, 3 hours lab. Fee. Corequisite: CHM 341 or 345.

CHM 345 Physical Chemistry I. (3)
fall
Introduction to quantum chemistry with application to electronic structure and dynamics of atoms and molecules. Prerequisite: only CHM 240 or both MAT 272 and 274 (with grades of "C" or higher).

CHM 346 Physical Chemistry II. (3)
spring
Introduction to equilibrium and statistical thermodynamics. Laws of thermodynamics, equations of state, multicomponent chemical and phase equilibria, and electrochemistry. Prerequisite: CHM 345. Corequisite: MAT 274.

CHM 348 Physical Chemistry Laboratory I. (1)
fall
Laboratory experiments in spectroscopy and computational chemistry. 4 hours lab. Fee. Pre- or corequisite: CHM 346. General Studies: L (if credit also earned in CHM 349 and 452)

CHM 349 Physical Chemistry Laboratory II. (1)
spring
Laboratory experiments in thermodynamics, electrochemistry, and computational chemistry. 4 hours lab. Fee. Pre- or corequisite: CHM 346. General Studies: L (if credit also earned in CHM 348 and 452)

CHM 392 Introduction to Research Techniques. (1–3)
fall, spring, summer
Instrumental methods and philosophy of research by actual participation in chemical research projects. May be repeated for a total of 6 semester hours. Prerequisite: approval of advisor and research supervisor.

CHM 424 Separation Science. (3)
not regularly offered
Basic theory and practical aspects of gas, liquid, ion-exchange, and gel-permeation chromatographies, and other important industrial and research techniques. 2 hours lecture, 4 hours lab. Fee. Prerequisite: CHM 318 or 332 or 346 or instructor approval.

CHM 431 Qualitative Organic Analysis. (3)
spring
Systematic identification of organic compounds. 1 hour lecture, 6 hours lab. Fee. Prerequisites: both CHM 118 (or 327) and 320 (or 336) or only instructor approval.

CHM 452 Inorganic Chemistry Laboratory. (1–2)
fall
Preparation and characterization of typical inorganic substances, emphasizing methods and techniques. 1 conference, 5 hours lab. Fee. Prerequisite: instructor approval. General Studies: L (if credit also earned in CHM 348 and 349)

CHM 453 Inorganic Chemistry. (3)
fall
Principles and applications of inorganic chemistry. Prerequisite: CHM 341 or 346.

CHM 460 Biological Chemistry. (3)
spring
Structure and function of macromolecules and their involvement in the processing of energy and information by living cells. Prerequisites: CHM 318, 346, 453.

CHM 471 Solid-State Chemistry. (3)
fall
Crystal chemistry, thermodynamics and electrochemistry of solids, nonstoichiometric compounds, diffusion and solid-state reactions, crystal growth, and selected topics. Pre- or corequisite: CHM 346 or instructor approval.

CHM 480 Methods of Teaching Chemistry. (3)
spring
Organization and presentation of appropriate content of chemistry; preparation of reagents, experiments, and demonstrations; organization of stock rooms and laboratories; experience in problem solving. Fee. Prerequisite: instructor approval.

CHM 481 Geochemistry. (3)
spring
Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere, and lithosphere. Cross-listed as GLG 481. Credit is allowed for only CHM 481 or GLG 481. Prerequisite: CHM 341 (or 346) or GLG 321.

CHM 485 Meteorites and Cosmochemistry. (3)
not regularly offered
Chemistry of meteorites and their relationship to the origin of the earth, solar system, and universe. Cross-listed as GLG 485. Credit is allowed for only CHM 485 or GLG 485.

CHM 494 Special Topics. (1–4)
not regularly offered
Possible topics:
(a) Chemistry of Global Climate Change. (3)

CHM 501 Current Topics in Chemistry. (1)
fall and spring
May be repeated for credit. Prerequisite: instructor approval.

CHM 521 Computer-Enhanced Analytical Chemistry. (3)
not regularly offered
Overview of chemometric tools in analytical chemistry, including multivariate calibration, spectral deconvolution, and experimental design. 2 hours lecture, 4 hours lab.

CHM 523 Advanced Analytical Chemistry. (3)
one a year
Theoretical principles of analytical instrumentation and measurements. Prerequisites: both CHM 325 and 346 or only instructor approval.

CHM 525 Spectrochemical Methods of Analysis. (4)
not regularly offered
Theoretical and practical considerations involving the use of optical instruments for chemical analyses. Emphasis on state-of-the-art trends. 3 hours lecture, 3 hours lab. Prerequisite: CHM 346 or instructor approval.

CHM 526 X-ray Methods of Analysis. (4)
not regularly offered
Theoretical and practical considerations involving the use of X-ray diffraction and spectroscopy for chemical and structural analyses. 3 hours lecture, 3 hours lab. Prerequisite: CHM 346.

CHM 527 Electrical Methods of Chemical Analysis. (4)
not regularly offered
Theoretical and practical considerations of polarographic, potentiometric, amperometric techniques, including modern electrochemical methods. 2 hours lecture, 6 hours lab. Prerequisite: CHM 346.

CHM 531 Advanced Organic Chemistry I. (3)
fall
Reaction mechanisms, reaction kinetics, linear free energy relationships, transition state theory, molecular orbital theory, and Woodward-Hoffmann rules. Prerequisites: CHM 318 (or 332), 346.

CHM 532 Advanced Organic Chemistry II. (2)
spring
Continuation of CHM 531. Prerequisite: CHM 531.

CHM 537 Organic Reactions. (3)
spring
Important synthetic reactions of organic chemistry emphasizing recently discovered reactions of preparative value. Prerequisite: CHM 531.

CHM 541 Advanced Thermodynamics. (3)
fall
Equilibrium thermodynamics, chemical reactions, and phase equilibria. Introduction to statistical thermodynamics, critical phenomena, and kinetics. Prerequisite: CHM 346.
CHM 545 Quantum Chemistry I. (3)
fall
Basic quantum theory, chemical bonding, and molecular structure. Prerequisite: CHM 346.

CHM 546 Quantum Chemistry II. (3)
spring
Quantum theory of rate processes. Principles of spectroscopy and nonlinear optics. Prerequisite: CHM 545.

CHM 548 Chemical Kinetics. (2)
not regularly offered
Kinetic theory and rate processes. Prerequisite: CHM 545.

CHM 553 Advanced Inorganic Chemistry. (3)
spring
Principles of modern inorganic chemistry and their applications over the entire periodic system. Prerequisites: CHM 346 and 453 (or their equivalents).

CHM 556 Topics in Inorganic Chemistry. (3)
not regularly offered
May be repeated for credit. Prerequisites: CHM 553; instructor approval.

CHM 579 Topics in Solid-State Chemistry. (3)
not regularly offered
May be repeated for credit. Prerequisite: instructor approval.

CHM 582 Topics in Geochemistry and Cosmochemistry. (3)
not regularly offered
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. Prerequisite: instructor approval.

CHM 583 Phase Equilibria and Geochemical Systems. (3)
not regularly offered
Natural reactions at high temperatures and pressures; silicate, sulfide, and oxide equilibria. Cross-listed as GLG 583. Credit is allowed for only CHM 583 or GLG 583. Prerequisite: instructor approval.

CHM 593 Applied Project. (1–12)
not regularly offered
Possible topics:
(a) Glass Blowing

Department of Chicana and Chicano Studies

Vicki L. Ruiz
Chair
(COWDN 224) 480/965-5091
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PROFESSORS
CANDELARIA, MONTIEL, PADILLA, RUIZ

ASSOCIATE PROFESSOR
ESCOBAR

ASSISTANT PROFESSORS
ALDAMA, GUTIÉRREZ, MAGAÑA

The Chicana and Chicano Studies program is an interdisciplinary degree program that examines the experiences, culture, artistic endeavors, and current status of people of Mexican descent living in the United States. The curriculum focuses on the practical application of Chicana and Chicano Studies (CCS) for career development in selected profes-

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
CHICANA AND CHICANO STUDIES HUMANITIES (CSH)

CSH 210 Chicana and Chicoano Poetry. (3)  
spring  
Writing seminar on Chicana and Chicoano poetics and intensive creative writing workshop. Workshop, seminar.

CSH 220 Chicana and Chicoano Cultural Expression. (3)  
fall  
Interrelation between economic, social, and political status and forms of artistic expression; i.e., music, dance, drama, literature, and graphic arts.

CSH 310 Chicana and Chicoano Folklore. (3)  
fall  
Analysis of Chicana and Chicoano folk beliefs, traditions, and practices.  
General Studies: HU, C

CSH 350 Mexican and Mexican American Artistic Production. (3)  
fall  
Overview of Mexican and Mexican American artistic production from colonial times to present; emphasis on religious and folk art.

CSH 351 Contemporary Chicana and Chicoano Art. (3)  
fall  
Intensive analysis of contemporary Chicana and Chicoano art movement as appraised within the context of contemporary American Art and the art of Mexico.  
General Studies: HU, C

CSH 363 Chicana and Chicoano Literature. (3)  
fall  
Development of Chicana and Chicoano literature; study of genres and themes; attention to literary antecedents. Cross-listed as ENGL 363. Credit is allowed for only CSH 363 or ENGL 363. See CSH Notes 1, 2.  
General Studies: L/HU, C

CSH 485 Chicana Writers. (3)  
fall  
Critical reading of Mexican American women authors; emphasis on contemporary (post-1970) poetry, novels, short stories, and essays.  
General Studies: L/HU, C

CSH 498 Pro-Seminar. (3)  
fall  
Required course for majors on topic selected by instructor; writing-intensive course related to the development of interdisciplinary research skills.

CHICANA AND CHICANO STUDIES

SOCIAL SCIENCE (CSS)

CSS 315 Chicano Family Structures and Perceptions. (3)  
fall  
Traditional and changing family relationships; emphasis on gender and intergenerational relations and impact of modern society on traditional family values.

CSS 330 Chicana and Chicoano Politics and Policy. (3)  
fall  
Historical/contemporary analysis of Chicana and Chicoano political ideologies, attitudes, strategies, and movements; relations with governmental agencies; and public policy issues.  
General Studies: C

CSS 331 Policy Issues in Chicana and Chicoano Urban Settings. (3)  
fall  
Historical, demographic, and sociological overview of the status of Chicanas and Chicanos in urban settings as well as the public policy relevance.  
General Studies: C

CSS 340 Chicanas and Chicanos in the U.S. Economy. (3)  
fall  
Historical/contemporary analysis of Chicanas’ and Chicanos’ relationship with the American economic system; emphasis on impact of changing American economy on Chicana and Chicoano community.  
General Studies: C, H

CSS 342 Issues in Chicana and Chicoano Gender. (3)  
fall  
Analysis of social construction of gender identities; emphasis on impact of American and Mexican cultural values on normative gender relations.  
General Studies: C

CSS 490 Field Studies in the Chicana and Chicoano Community. (3)  
fall  
Introduction to principles and methods of qualitative research applied to the Chicana and Chicoano community.  
General Studies: C

CSS 498 Pro-Seminar. (3)  
fall  
Required course for majors on topic selected by instructor; writing-intensive course related to the development of interdisciplinary research skills.

Computer Science

A major in Computer Science is offered in both the College of Liberal Arts and Sciences and the College of Engineering and Applied Sciences. For faculty and course descriptions, see “Department of Computer Science and Engineering,” page 236.

COMPUTER SCIENCE—B.S.

The program in Computer Science consists of 34 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. The university requirement for literacy and critical inquiry is to be met in part by ECE 400 or a General Studies L course approved by the department.

A minimum cumulative GPA of 2.50 is required to begin upper-division work in the major. A minimum grade of “C” is required in all CSE courses used for degree credit.

For more information, contact an advisor in the Office for Academic Programs in SS 111, or the Computer Science and Engineering Advising Center in GWC 224.

The degree is accredited by the Computer Science Accreditation Board, so more than 120 semester hours are required to complete the degree.

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### Economics

The College of Liberal Arts and Sciences and the College of Business offer a B.A. or B.S. degree in Economics. Faculty, course descriptions, and the major requirements in the College of Business are listed under “Department of Economics,” page 160. For more information, CLAS Economics majors should call the faculty liaison at 480/965-2128 or visit BAC 655.

**ECONOMICS—B.A. OR B.S.**

The program in Economics consists of 45 semester hours of course work, 24 of which, at a minimum, must be in economics, and the remainder in closely related fields to be selected from the “Approved List of Related Field Courses” in consultation with the faculty advisor.

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

- ECN 111 Macroeconomic Principles SB .................................. 3
- ECN 112 Microeconomic Principles SB ................................. 3
- MAT 210 Brief Calculus MA .................................................. 3
- STP 226 Elements of Statistics CS ...................................... 3

**Total** ................................................................................. 12

While MAT 210 meets the minimum mathematics requirement to major in Economics, all Economics majors who anticipate going on to graduate school in economics or in business or to law school are encouraged to take MAT 270 Calculus with Analytic Geometry I. Majors are encouraged to pursue further course work in mathematics. MAT 270 may be taken in lieu of MAT 210.

To qualify for upper-division course work in economics, the Economics major must earn a minimum grade of “C” in each of the previously listed courses, have junior class standing (56 semester hours), and have a minimum cumulative GPA of 2.50. ECN 313 Intermediate Macroeconomic Theory and ECN 314 Intermediate Microeconomic Theory are required and should be taken after the completion of the previously listed courses and before other upper-division courses in economics.

Credit earned by an Economics major in ECN 484 Economics Internship, whether as a legislative intern or through

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**NOTE:** For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
ECN 494 ST: Public Choice ........................................................ 3
FIN 361 Managerial Finance ...................................................... 3

SECONDARY EDUCATION—B.A.E.

The minor teaching field consists of 21 semester hours. ECN 111 Macroeconomic Principles and ECN 112 Microeconomic Principles and MAT 210 Brief Calculus are required. The remainder must be approved by the advisor in consultation with the student.

Social Studies. See “Social Studies,” page 446.

GRADUATE PROGRAMS

The faculty in the Department of Economics offer programs leading to the M.S. and Ph.D. degrees. See the Graduate Catalog for requirements.

For faculty and course descriptions see “Department of Economics,” page 160.

Department of English

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REGENTS’ PROFESSORS
DUBIE, RÍOS

PROFESSORS
ADAMS, BENDER, BJORK, BOYER, BRACK, BRINK, CANDELARIA, CARLSON, CROWLEY, DONELSON, GUTIERREZ, HELMS, KEHL, LESTER, LIGHTFOOT, MAJOR, A. NILSEN, D. NILSEN, RHODES, RICHARD, ROEN, SANDS, SENSIBAR

ASSOCIATE PROFESSORS
BATES, BIVONA, CASTLE, CHANCY, CORSE, DeLAMOTTE, GOGGIN, GOLDBERG, HORAN, LUSSIER, MAHONEY, McNALLY, MILLER, MORGAN, NELSON, PERRY, PRITCHARD, RAMAGE, SAVARD, SCHWALM, TOHE, van GELDEREN

ASSISTANT PROFESSORS
BLASINGAME, FUSE, HARRIS, JOHNSON, MILUN, STEVENS, VOADEN, WEBB PETERSON

SENIOR LECTURERS
COOK, COOPER, DUGAN, OBERMEIER, SUDOL

LECTURERS
DUERDEN, DWYER, HEENAN, NORTON, RAY, WHEELER

ACADEMIC PROFESSIONAL
GLAU

ENGLISH—B.A.

The faculty in the Department of English offer courses in comparative literature, creative writing, English as a second language, English education, English linguistics, literature and language, and rhetoric and composition. Undergraduate degrees include the B.A. degree in English, with a concentration in either linguistics or literature, and a Secondary Education Bachelor of Arts in Education degree. The faculty also offer a Writing Certificate. Students interested in creative writing are encouraged to use electives to pursue a creative writing emphasis. Students should work with advisors to design an individual program of study that takes full advantage of the diversity within the department as well as interdisciplinary and multicultural contexts available in the college and university.

The B.A. degree in English with a concentration in linguistics consists of 42 semester hours. Required courses are as follows:

ENG 200 Critical Reading and Writing About Literature L/HU......................................................... 3
ENG 213 Introduction to the Study of Language......................................................... 3
ENG 221 Survey of English Literature HU, H .......................................................... 3
ENG 222 Survey of English Literature HU, H (3)
ENG 241 American Literature HU (3)
ENG 242 American Literature HU (3)
ENG 312 English in Its Social Setting HU/SB ......................................................... 3
ENG 313 Phonology and Morphology .......................................................... 3
ENG 314 Modern Grammar.......................................................... 3
ENG 413 History of the English Language HU............................................. 3
ENG 414 Studies in Linguistics (repeated for a total of nine semester hours) .................... 9

Twelve additional hours are electives, chosen in consultation with the student’s advisor. These courses must be at the 200 level or above. At least one must be a three-credit course in a modern language other than English at the 400 level or above. A grade of “C” or higher is required in all courses taken for the major. No course may be used to satisfy more than one requirement.

The B.A. degree in English with a concentration in literature consists of 45 semester hours. Required courses are as follows:

ENG 200 Critical Reading and Writing About Literature L/HU......................................................... 3
ENG 221 Survey of English Literature HU, H .......................................................... 3
ENG 222 Survey of English Literature HU, H (3)
ENG 241 American Literature HU .......................................................... 3
ENG 242 American Literature HU .......................................................... 3
ENG 421 Shakespeare HU .......................................................... 3

Courses taken to fulfill the areas and periods listed below can be used to satisfy more than one of these requirements:

Upper-division course in critical theory (3)
Upper-division course in gender, American ethnic literatures, and/or postcolonial studies (3)
Course in the history and/or structure of language (3)
Upper-division course in literature before 1660, exclusive of ENG 421 (3)
Upper-division course in literature between 1660 and 1900 (3)
Upper-division course in literature after 1900 (3)

Additional hours needed to complete the 45 hours are electives chosen from the department’s offerings at the 200 level and above. At least 18 of the 45 hours must be taken at the 300 or 400 level. A grade of “C” or higher is required in all courses taken for the major.
MINORS

The minor in English with a Concentration in Linguistics consists of 24 semester hours. Required courses are as follows:

ENG 200 Critical Reading and Writing About Literature .......................... 3
ENG 213 Introduction to the Study of Language ..................................... 3
ENG 221 Survey of English Literature HU, H .................................... 3
ENG 241 American Literature HU ..................................................... 3
ENG 312 English in Its Social Setting HU ......................................... 3
ENG 413 History of the English Language HU ................................... 3

The six additional hours are electives chosen from the department’s offerings, with at least one course (three hours) required at the 300 or 400 level. A grade of “C” or higher is required in all courses for the minor.

The minor in English with a Concentration in Literature consists of 24 semester hours. Required courses are as follows:

ENG 200 Critical Reading and Writing About Literature L/HU ............... 3
ENG 221 Survey of English Literature HU, H .................................... 3
ENG 241 American Literature HU ..................................................... 3
ENG 421 Shakespeare HU ............................................................... 3

Also required are two upper-division courses in literature (six hours) and two electives (six hours) chosen from among the department’s offerings, with at least one course (three hours) at the 300 or 400 level. A grade of “C” or higher is required in all courses taken for the minor.

WRITING CERTIFICATE

The Writing Certificate consists of 19 semester hours. Initial entry into the program requires a minimum GPA of 3.00 in English 101 and 102, 105, or 107 and 108. Students must also have completed at least 30 hours of course work and must have a minimum GPA of 3.00. Required courses are as follows:

ENG 216 Persuasive Writing on Public Issues L .................................. 3
ENG 301 Writing for the Professions L .............................................. 3
ENG 372 Document Production L ..................................................... 3
ENG 472 Rhetorical Studies ............................................................... 3
ENG 484 Writing Internship ............................................................. 3
ENG 498 PS: Portfolio ................................................................. 1

Total ............................................................................................... 16

Also required is an additional writing course in English (three hours) or a writing or design course (three hours) selected from an approved list of courses across campus. All students are required to submit a portfolio before receiving the certificate.

SECONDARY EDUCATION—B.A.E.

The major teaching field consists of 45 semester hours in English. Required courses are as follows:

ENG 200 Critical Reading and Writing About Literature L/HU ............... 3
ENG 212 English Prose Style L ...................................................... 3
ENG 221 Survey of English Literature HU, H .................................... 3
ENG 241 American Literature HU ..................................................... 3
ENG 312 English in Its Social Setting HU ......................................... 3
ENG 421 Shakespeare HU ............................................................... 3
ENG 471 Literature for Adolescents HU ......................................... 3
ENG 480 Methods of Teaching English: Composition .................. 3
ENG 482 Methods of Teaching English: Language ................... 3

Total ............................................................................................... 33

Also required is one course in women’s literature or American ethnic literatures. Nine additional hours are electives chosen from Department of English offerings, six hours of which must be in the upper division. ENG 471, 480, and 482 must be taken before student teaching.

The minor teaching field consists of the following required courses:

ENG 200 Critical Reading and Writing About Literature L/HU ............... 3
ENG 212 English Prose Style L ...................................................... 3
ENG 221 Survey of English Literature HU, H .................................... 3
ENG 241 American Literature HU ..................................................... 3
ENG 421 Shakespeare HU ............................................................... 3
ENG 471 Literature for Adolescents HU ......................................... 3
ENG 480 Methods of Teaching English: Composition .................. 3
ENG 482 Methods of Teaching English: Language ................... 3

Total ............................................................................................... 24

These courses are also recommended for Elementary Education majors.

GRADUATE PROGRAMS

The faculty in the Department of English offer programs leading to the M.A. degree in English (with concentrations in comparative literature, English linguistics, literature and language, and rhetoric and composition), Master of Fine Arts degree in Creative Writing (options include fiction, nonfiction, poetry, and screenwriting), Master of Teaching English as a Second Language degree, and Ph.D. degree in English with two concentrations, one in literature and one in rhetoric/composition and linguistics. See the Graduate Catalog for requirements.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
ENGLISH (ENG)

ENG 101 First-Year Composition. (3)
fall, spring, summer
Discovering, organizing, and developing ideas in relation to the writer's purpose, subject, and audience. Emphasis on modes of written discourse and effective use of rhetorical principles. Foreign students, see ENG 107. Prerequisite: see "University Testing Requirements," page 63, and "First-Year Composition Requirement," page 74.

ENG 102 First-Year Composition. (3)
fall, spring, summer
Critical reading and writing; emphasis on strategies of academic discourse. Research paper required. Foreign students, see ENG 108. Prerequisite with a grade of "C" or higher: ENG 101.

ENG 105 Advanced First-Year Composition. (3)
fall and spring
Concentrated composition course for students with superior writing skills; intensive reading; research papers; logical and rhetorical effectiveness. Not open to students with credit for First-Year Composition. Prerequisite: see “University Testing Requirements,” page 63, and “First-Year Composition Requirement,” page 74.

ENG 107 English for Foreign Students. (3)
fall and spring
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.

ENG 108 English for Foreign Students. (3)
fall and spring
For foreign students; critical reading and writing; strategies of academic discourse. Research paper required. Satisfies graduation requirement of ENG 102. Prerequisite with a grade of "C" or higher: ENG 107.

ENG 114 English Grammar and Usage. (3)
fall and spring
Fundamentals of English grammar (word and phrase structure) and of English usage (punctuation, grammatical correctness).

ENG 200 Critical Reading and Writing About Literature. (3)
fall and spring
Introduction to the terminology, methods, and objectives of the study of literature, with practice in interpretation and evaluation. See ENG Note 1. Prerequisite: English major or minor.

ENG 201 World Literature. (3)
fall
Classical and medieval periods. Selections from the great literature of the world in translation and lectures on the cultural background. See ENG Note 1.

ENG 202 World Literature. (3)
spring
Renaissance and modern periods. Selections from the great literature of the world in translation and lectures on the cultural background. See ENG Note 1.

ENG 204 Introduction to Contemporary Literature. (3)
once a year
Poetry, fiction, drama, and possibly other genres. See ENG Note 1.

ENG 210 Introduction to Creative Writing. (3)
fall and spring
Beginning writing of poetry, fiction, and drama (both stage and screen). Separate sections for each genre. Each genre may be taken once. See ENG Note 1.

ENG 212 English Prose Style. (3)
not regularly offered
Analysis and practice of writing in various classical and modern prose styles. See ENG Note 1. Prerequisite: preferably English major or both approval of advisor and instructor. Prerequisite with a grade of "B" or higher: ENG 102 (or 105).

ENG 213 Introduction to the Study of Language. (3)
fall and spring
Language as code; phonetics, phonology, morphology, and syntax; the lexicon; language acquisition; sociolinguistics. See ENG Note 1.

ENG 215 Strategies of Academic Writing. (3)
fall and spring
Advanced course in techniques of analyzing and writing academic expository prose. Writing is research based. See ENG Note 1.

ENG 216 Persuasive Writing on Public Issues. (3)
fall and spring
Advanced course in techniques of analyzing and writing persuasive arguments addressing topics of current public interest. Papers are research based. See ENG Note 1.

ENG 217 Writing Reflective Essays. (3)
fall and spring
Critical examination of the influences discourse has on formation of identity; narrative analyses of self and culture. See ENG Note 1.

ENG 218 Writing About Literature. (3)
fall and spring
Advanced writing course requiring analytical and expository essays about fiction, poetry, and drama. For non-English majors. See ENG Note 1.

ENG 219 American Literature. (3)
fall and spring
From the Civil War to the present. Development of realism, naturalism, and modernism, and contemporary trends in prose and poetry. See ENG Note 1.

ENG 220 American Literature. (3)
fall and spring
Romantic, Victorian, and 20th-century literature. Emphasis on major writers and their works in their literary and historical contexts. See ENG Note 1.

ENG 221 Survey of English Literature. (3)
fall and spring
Medieval, Renaissance, and 18th-century literature. Emphasis on major writers and their works in their literary and historical context. See ENG Note 1.

ENG 222 Survey of English Literature. (3)
fall and spring
Romantic, Victorian, and 20th-century literature. Emphasis on major writers and their works in their literary and historical contexts. See ENG Note 1.

ENG 303 Classical Backgrounds of English Literature. (3)
not regularly offered
Selected readings of Greek and Latin literature in translation, emphasizing forms, ideas, and myths as they relate to literature in English. See ENG Notes 1, 2.

ENG Note 1. Completion of the First-Year Composition requirement (ENG 101 and 102 [or 105] or ENG 107 and 108 with a grade of "C" or higher) is a prerequisite for all English courses above the 100 level.

ENG Note 2. A term paper or equivalent out-of-class written work is required in all upper-division (300- and 400-level) ENG courses.

ENG Note 3. English majors and minors are expected to have completed ENG 200 before taking 400-level literature courses.
ENG 307 Utopian Literature. (3)
not regularly offered
Selected works from the present to the classical period, including Walden Two, Walden, Utopia, and The Republic. See ENG Notes 1, 2.
General Studies: L/HU, H

ENG 310 Intermediate Creative Writing. (3)
fall and spring
Separate sections for fiction and poetry. May be taken once for poetry, once for fiction. Lecture, writing assignments, discussion, criticism. See ENG Notes 1, 2. Prerequisite: ENG 210 or instructor approval.

ENG 312 English in Its Social Setting. (3)
fall and spring
Introduction to the sociolinguistic study of the English language. See ENG Notes 1, 2.
General Studies: L/HU, C

ENG 313 Phonology and Morphology. (3)
spring
Introduction to English morphology, phonology, etymology, and phonetic aspects of rhyme, alliteration, and other sound-based literary devices. See ENG Notes 1, 2.

ENG 314 Modern Grammar. (3)
fall and spring
Modern descriptive models of English grammar. See ENG Notes 1, 2.

ENG 321 Introduction to Shakespeare. (3)
fall and spring
Shakespeare’s major comedies, histories, and tragedies. See ENG Notes 1, 2.
General Studies: L/HU

ENG 331 American Drama. (3)
one a year
Major works in the development of American drama from its beginnings to the present. See ENG Notes 1, 2.
General Studies: L

ENG 332 Major American Novels. (3)
one a year
Novels from the 19th century to the present studied in their historical and cultural contexts. See ENG Notes 1, 2.

ENG 333 American Ethnic Literature. (3)
one a year
Examination of America’s multiethnic identity through works of literature that depict American ethnic, gender, and class sensibilities. Cross-listed as AFH 333. Credit is allowed for only AFH 333 or ENG 333. See ENG Notes 1, 2.
General Studies: L, C

ENG 334 Literature of African Americans. (3)
not regularly offered
Thematic and cultural study of African American literature through the Harlem Renaissance. Cross-listed as AFH 353. Credit is allowed for only AFH 353 or ENG 353. See ENG Notes 1, 2.

ENG 355 History of the Drama. (3)
not regularly offered
Development of European drama from the Greek to the Romantic period. See ENG Notes 1, 2.

ENG 356 The Bible as Literature. (3)
fall and spring
Readings in Old and New Testaments, emphasizing ideas, literary types, and sources as they appear in literature. See ENG Notes 1, 2.

ENG 357 Introduction to Folklore. (3)
not regularly offered
Survey of the history, genres, and dynamics of folklore, with emphasis on oral traditions. See ENG Notes 1, 2.

ENG 359 American Indian Literatures. (3)
not regularly offered
Selected oral traditions of American Indians and their influences on contemporary Native American literary works. See ENG Notes 1, 2.

ENG 360 Sound Film Genres. (4)
spring
Examination of the western, the horror film, the comedy, and other genres. 3 hours lecture, screenings. See ENG Notes 1, 2.

ENG 361 Silent Film. (4)
fall
Development of motion pictures from 1850 through 1930. 3 hours lecture, screenings. See ENG Notes 1, 2.

ENG 363 Chicana and Chicano Literature. (3)
fall
Development of Chicana and Chicano literature; study of genres and themes; attention to literary antecedents. Cross-listed as CSH 363. Credit is allowed for only CSH 363 or ENG 363. See ENG Notes 1, 2.

ENG 364 African American Literature: Beginnings Through the Harlem Renaissance. (3)
fall
Thematic and cultural study of African American literature through the Harlem Renaissance. Cross-listed as AFH 353. Credit is allowed for only AFH 353 or ENG 353. See ENG Notes 1, 2.
General Studies: L/HU, C

ENG 365 African American Literature: Harlem Renaissance to the Present. (3)
spring
Thematic and cultural study of African American literature from the Harlem Renaissance to the present. Cross-listed as AFH 354. Credit is allowed for only AFH 354 or ENG 354. See ENG Notes 1, 2.
General Studies: L/HU, C

ENG 366 Creative Writing Workshop. (3)
fall and spring
Separate poetry and fiction workshops for experienced writers, emphasizing individual style. May be taken once for poetry, once for fiction. See ENG Notes 1, 2. Prerequisite: ENG 310 or instructor approval.

ENG 367 Technical Writing. (3)
fall and spring
Development of technical writing skills in the area of applications and technical reports. Professional setting for the development of technical writing skills. See ENG Notes 1, 2.

ENG 368 Advanced Technical Writing. (3)
fall and spring
Advanced technical writing skills in the area of applications and technical reports. Professional setting for the development of technical writing skills. See ENG Notes 1, 2.

ENG 369 Technical Editing. (3)
fall
Fundamentals of editing technical and professional materials. Role of editors in analyzing, revising, and polishing manuscripts. Successful writer-editor dialogues. See ENG Notes 1, 2. Prerequisite: ENG 102 (or its equivalent).

ENG 370 Document Production. (3)
spring
Introduction to document design and production. Practice in critique and in writing the content of publications. Lecture, discussion. See ENG Notes 1, 2. Prerequisite: instructor approval.

ENG 371 Intermediate Creative Writing. (3)
fall and spring
Development of literary and poetic techniques, with attention to the process of writing and to the development of the writer as author. See ENG Notes 1, 2.

ENG 372 Document Production. (3)
spring
Examination of the western, the horror film, the comedy, and other genres. 3 hours lecture, screenings. See ENG Notes 1, 2.

ENG 374 Technical Editing. (3)
fall and spring
Fundamentals of editing technical and professional materials. Role of editors in analyzing, revising, and polishing manuscripts. Successful writer-editor dialogues. See ENG Notes 1, 2. Prerequisite: ENG 102 (or its equivalent).

ENG 375 Advanced Creative Writing. (3)
spring
Separate poetry and fiction workshops for experienced writers, emphasizing individual style. May be taken once for poetry, once for fiction. See ENG Notes 1, 2. Prerequisite: ENG 310 or instructor approval.

ENG 376 Advanced Technical Writing. (3)
fall and spring
Advanced technical writing skills in the area of applications and technical reports. Professional setting for the development of technical writing skills. See ENG Notes 1, 2.

ENG 377 Technical Editing. (3)
fall
Fundamentals of editing technical and professional materials. Role of editors in analyzing, revising, and polishing manuscripts. Successful writer-editor dialogues. See ENG Notes 1, 2. Prerequisite: ENG 102 (or its equivalent).

ENG 378 Document Production. (3)
spring
Examination of the western, the horror film, the comedy, and other genres. 3 hours lecture, screenings. See ENG Notes 1, 2.

ENG 379 Intermediate Creative Writing. (3)
fall and spring
Development of literary and poetic techniques, with attention to the process of writing and to the development of the writer as author. See ENG Notes 1, 2.

ENG 380 Document Production. (3)
spring
Examination of the western, the horror film, the comedy, and other genres. 3 hours lecture, screenings. See ENG Notes 1, 2.
ENG 412 Professional Writing. (3)
not regularly offered
Lectures and conferences concerning techniques of writing for publication. See ENG Notes 1, 2. Prerequisite: ENG 310 or instructor approval.
ENG 413 History of the English Language. (3)
not regularly offered
Development of English from the earliest times to the modern period. See ENG Notes 1, 2. Prerequisite: junior standing or instructor approval.
General Studies: HU
ENG 414 Studies in Linguistics. (3)
fall and spring
Relationship of linguistics to literature, gender, power, and other social issues. May be repeated for credit. See ENG Notes 1, 2. Prerequisite: junior standing.
ENG 415 Medieval Literature. (3)
not regularly offered
Medieval English literature in translation, from Beowulf to Malory (excluding Chaucer), emphasizing cultural and intellectual backgrounds; includes continental works. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 416 Chaucer: Canterbury Tales. (3)
not regularly offered
Chaucer's language, his last work, and its relationship to continental and insular traditions. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 417 Chaucer: Troilus and Criseyde and the Minor Works. (3)
not regularly offered
Chaucer's language, his major poem, and his early works in their medieval context. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 418 Renaissance Literature. (3)
fall
Topics, authors, and themes in English literature, 1485–1603. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: L/HU
ENG 419 English Literature in the Early 17th Century. (3)
fall
Topics, authors, and themes in English literature, 1603–1660. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: L/HU
ENG 420 Shakespeare. (3)
fall and spring
Selection of comedies, histories, and tragedies. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 421 Studies in Shakespeare. (3)
not regularly offered
Topics for close examination in selected dramatic and/or nondramatic works. May be repeated for credit when topics vary. See ENG Notes 1, 2, 3. Prerequisite: ENG 421 or instructor approval.
General Studies: HU
ENG 422 Renaissance Drama. (3)
spring
Topics, authors, and themes in the drama of the Tudor and early Stuart periods. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: L/HU
ENG 423 Milton. (3)
not regularly offered
Selected prose and poetry, emphasizing Paradise Lost, Paradise Regained, and Samson Agonistes. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 424 Studies in English Romanticism. (3)
fall
All genres of Romantic literature in cultural contexts, Blake to the death of Wordsworth. May be repeated for credit. See ENG Notes 1, 2, 3.
General Studies: HU
ENG 425 Victorian Poetry. (3)
fall
Poetry of the second half of the 19th century. May include such poets as Tennyson, Browning, and Arnold. See ENG Notes 1, 2, 3. Prerequisite: ENG 222 or instructor approval.
General Studies: L/HU
ENG 426 Victorian Cultural Backgrounds. (3)
not regularly offered
Social, religious, and other cultural issues of the period. May include Carlyle, Ruskin, Darwin, Arnold, Pater, and Morris. See ENG Notes 1, 2, 3. Prerequisite: ENG 222 or instructor approval.
General Studies: L/HU
ENG 427 Restoration and Early 18th Century. (3)
not regularly offered
Development of English from the earliest times to the modern period. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 428 The Later 18th Century. (3)
not regularly offered
Writers and movements in the nondramatic literature of the Restoration and early 18th century. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 429 Restoration and 18th-Century Drama. (3)
not regularly offered
English drama 1600–1800. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 430 Victorian Cultural Backgrounds. (3)
not regularly offered
Writers and movements, and books during the second half of the 18th century. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 431 19th-Century American Poetry. (3)
not regularly offered
Themes and developments in American poetry to 1900, including Poe, Whitman, and Dickinson. See ENG Notes 1, 2, 3.
General Studies: HU
ENG 432 20th-Century American Drama. (3)
not regularly offered
American drama since World War I, especially experimental techniques. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.
General Studies: HU
ENG 433 Victorian Poetry. (3)
fall
Poetry of the second half of the 19th century. May include such poets as Tennyson, Browning, and Arnold. See ENG Notes 1, 2, 3. Prerequisite: ENG 222 or instructor approval.
General Studies: L/HU
ENG 434 American Poetry, 1900–1945. (3)
not regularly offered
Developments in theory and practice of major poets. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 435 19th-Century American Poetry. (3)
not regularly offered
Themes and developments in American poetry to 1900, including Poe, Whitman, and Dickinson. See ENG Notes 1, 2, 3.
General Studies: HU
ENG 436 American Poetry, 1900–1945. (3)
not regularly offered
Developments in theory and practice of major poets. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 437 American Drama since World War I, especially experimental techniques. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.
General Studies: HU
ENG 438 American Realism, 1870–1910. (3)
spring
Writers and influences that shaped the development of literary realism. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.
General Studies: L/HU
ENG 439 Studies in American Realism, 1870–1910. (3)
spring
Writers and influences that shaped the development of literary realism. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.
General Studies: L/HU
ENG 440 American Poetry, 1900–1945. (3)
not regularly offered
Developments in theory and practice of major poets. See ENG Notes 1, 2, 3. Prerequisite: ENG 221 or instructor approval.
General Studies: HU
ENG 441 American Drama since World War I, especially experimental techniques. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.
General Studies: HU
ENG 442 19th-Century British and Irish Drama. (3)
not regularly offered
American drama since World War I, especially experimental techniques. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.
General Studies: HU
ENG 443 American Drama since World War I, especially experimental techniques. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.
General Studies: HU
ENG 444 American Realism, 1870–1910. (3)
spring
Writers and influences that shaped the development of literary realism. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.
General Studies: L/HU
ENG 445 Studies in American Realism, 1870–1910. (3)
spring
Writers and influences that shaped the development of literary realism. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.
General Studies: L/HU
ENG 446 American Realism, 1870–1910. (3)
spring
Writers and influences that shaped the development of literary realism. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.
General Studies: L/HU
ENG 447 American Realism, 1870–1910. (3)
spring
Writers and influences that shaped the development of literary realism. May be repeated for credit. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.
ENG 451 The Novel to Jane Austen. (3)
not regularly offered
From origins of prose fiction through the 18th century. See ENG Notes 1, 2, 3.  
General Studies: HU, H

ENG 452 The 19th-Century Novel. (3)
spring
May include such novelists as Austen, Dickens, Eliot, and Conrad. See ENG Notes 1, 2, 3.  
General Studies: HU

ENG 453 The American Novel to 1900. (3)
not regularly offered
Rise and development of the novel to Dreiser. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or instructor approval.  
General Studies: HU

ENG 454 The American Novel, 1900–1945. (3)
not regularly offered
Developments in theory and practice of major novelists. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or 242 or instructor approval.  
General Studies: HU

ENG 455 The Form of Verse: Theory and Practice. (3)
not regularly offered
Types, history, criticism, and schools of theory of metrical form. Analysis of lyric, narrative, and dramatic poetry. See ENG Notes 1, 2.  

ENG 456 American Poetry Since 1945. (3)
fall
Major American poets of the period. Developments in theory and practice. See ENG Notes 1, 2, 3. Prerequisite: ENG 241 or instructor approval.  
General Studies: HU

ENG 457 American Novel Since 1945. (3)
not regularly offered
Major novelists of the period. Developments in theory and practice. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.  
General Studies: L/HU

ENG 458 American Novel Since 1945. (3)
not regularly offered
Major novelists of the period. Developments in theory and practice. See ENG Notes 1, 2, 3. Prerequisite: ENG 242 or instructor approval.  

ENG 459 Studies in African American/Caribbean Literatures. (3)
not regularly offered
Studies in African American or Caribbean literatures according to genre, period, theory, or selected authors. May be repeated for credit when topics vary. Cross-listed as AFH 459. Credit is allowed for only AFH 459 or ENG 459. See ENG Notes 1, 2, 3.  

ENG 460 Western American Literature. (3)
fall
Critical examination of ideas and traditions of the literature of the western United States, including the novel. See ENG Notes 1, 2, 3.  
General Studies: L/HU

ENG 461 Women and Literature. (3)
not regularly offered
Selected topics in literature by or about women. May be repeated for credit when topics vary. See ENG Notes 1, 2, 3.  
General Studies: HU

ENG 462 20th-Century Women Authors. (3)
not regularly offered
Critical examination of literature by 20th-century women writers. May be repeated for credit when topics vary. See ENG Notes 1, 2, 3.  
General Studies: HU

ENG 463 European Drama from Ibsen to 1914. (3)
not regularly offered
Chief continental and British dramatists of the period, emphasizing the beginnings and development of realism. See ENG Notes 1, 2, 3.  
General Studies: HU

ENG 464 European Drama from 1914 to the Present. (3)
not regularly offered
Chief continental and British dramatists of the period, emphasizing experimental techniques. See ENG Notes 1, 2, 3.  
General Studies: HU

ENG 470 Symbols and Archetypes in Children’s Literature. (3)
fall
Various critical approaches and recurring themes studied in relation to classical and contemporary children’s literature. Lecture, discussion, reading. See ENG Notes 1, 2, 3.  

ENG 471 Literature for Adolescents. (3)
fall and spring
Prose and poetry that meet the interests and capabilities of junior high and high school students. Recent literature stressed. A passing grade of at least “C” required before students are permitted to student teach in English. See ENG Notes 1, 2, 3.  
General Studies: HU

ENG 472 Rhetorical Studies. (3)
fall and spring
Developments in theory and practice of major rhetorical inquiries. Seminar, workshop. See ENG Notes 1, 2. Prerequisite: junior standing.  

ENG 480 Methods of Teaching English: Composition. (3)
fall or spring and summer
Methods of instruction, organization, and presentation of appropriate content in the teaching of composition and other writing skills. See ENG Notes 1, 2.  

ENG 482 Methods of Teaching English: Language. (3)
fall or spring and summer
Methods of instruction, organization, and presentation of appropriate content in language and usage for junior and senior high schools. Lecture, discussion, lab. See ENG Notes 1, 2.

ENG 484 Writing Internship. (3–6)
fall and spring
Students participate in regular internships or service learning internships under the Division of Undergraduate Academic Services or approved Writing Certificate internships. See ENG Notes 1, 2.  

ENG 498 Pro-Seminar. (1–7)
fall and spring
See ENG Notes 1, 2. Possible topics: 
(a) Portfolio. (1)  

ENG 500 Research Methods. (3)
fall
Methodology and resource materials for research. Analysis of criticism and scholarship, including evaluation of sources.  

ENG 501 Introduction to Comparative Literature. (3)
not regularly offered
Problems, methods, and principles, illustrated by selected critical essays and literary texts.  

ENG 502 Contemporary Critical Theory. (3)
fall
Advanced survey of major schools of 20th-century literary and critical theory. Lecture, discussion. Cross-listed as HUM 549. Credit is allowed for only ENG 502 or HUM 549.  

ENG 503 Old English. (3)
not regularly offered
Elements of Old English grammar, with selected readings.  

ENG 504 Old English Literature. (3)
not regularly offered
Intensive literary, linguistic, and cultural study of Old English literature. May be repeated for credit when topics vary. Prerequisite: ENG 507.  

ENG 509 Middle English. (3)
not regularly offered
Study of the principal dialects of the language, with selected readings. Prerequisite: graduate standing.  

ENG 512 The Teaching of Composition. (3)
not regularly offered
Theory and practice of teaching writing at all levels. Emphasis on current research. Prerequisites: teaching experience; instructor approval.  

ENG 515 Middle English Literature. (3)
not regularly offered
English literature from the 12th through the 15th centuries, exclusive of Chaucer. Prerequisite: ENG 509 or instructor approval.  

ENG 517 Contemporary Rhetorical Theory. (3)
fall
Investigation of the work of such important rhetorical theorists as Burke, Toulmin, Perelman, Gates, and Cixous.  

ENG 520 Renaissance Literature. (3)
fall
Pros and poetry of the English Renaissance, excluding drama.  

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
ENG 521 Shakespeare. (3)
Once a year
Selection of comedies, histories, and tragedies presented in the context of literary history and critical theories, with an emphasis on classical and medieval backgrounds.

ENG 525 American Literary Criticism. (3)
Not regularly offered
Analysis and discussion of leading historical and critical interpretations of American literature from the beginnings to the present.

ENG 530 Classical Rhetoric and Written Composition. (3)
Fall
Relationship of major texts in classical rhetoric to developments in composition theory, literary theory, and practice through the 19th century.

ENG 531 Rhetorical Theory and Literary Criticism. (3)
Spring
Intensive study of major rhetorical theorists of the 20th century in such areas as literary criticism, discourse theory, and composition theory.

ENG 532 Composition Theory. (3)
Not regularly offered
Intensive study in the rhetorical categories of invention, arrangement, style, aims, modes, and forms of written discourse.

ENG 545 Studies in English Literature. (3)
Not regularly offered
Selected authors or issues. May be repeated for credit.

ENG 547 Studies in American Literature. (3)
Not regularly offered
Selected authors or issues. May be repeated for credit.

ENG 549 Studies in Comparative Literature. (3)
Not regularly offered
Selected authors or issues. May be repeated for credit.

ENG 550 Contemporary Comparative Literature. (3)
Not regularly offered
Comparative studies in modern literature in English and other literatures in translation. May be repeated for credit when topics vary.

ENG 559 Advanced Study in African American/Caribbean Literatures. (3)
Not regularly offered
Advanced study in African American or Caribbean literatures, theory, and criticism. May be repeated for credit when topics vary. Lecture, studio.

ENG 560 Studies in Dramatic Forms. (3)
Not regularly offered
Selected topics in dramatic and cinematic literature, history, criticism, theory, and crossdisciplinary study. May be repeated for credit when topics vary. Lecture, studio.

ENG 571 Advanced Study in Literature for Adolescents. (3)
Not regularly offered
History and criticism of adolescent literature. Prerequisite: ENG 471 or instructor approval.

ENG 573 Censorship and Literature. (3)
Not regularly offered
History of censorship, primarily in the United States, and significant court decisions that affected writers and books.

ENG 580 Practicum. (1–12)
Not regularly offered

ENG 591 Seminar. (3)
Fall and spring
Selected topics regularly offered in the various areas of English studies.

ENG 594 Conference and Workshop. (1–12)
Not regularly offered

ENG 598 Special Topics. (1–4)
Not regularly offered

ENG 599 Thesis. (1–12)
Not regularly offered

LINGUISTICS (LIN)
See the Graduate Catalog for the LIN courses.

WRITING ACROSS THE CURRICULUM (WAC)

WAC 101 Introduction to Academic Writing, (3)
Fall and spring
Combines classroom and supplemental instruction to teach academic genres of writing, including definition, summary, and analysis.

WAC 107 Introduction to Academic Writing for International Students. (3)
Fall and spring
For students from non-English-speaking countries. Combines classroom and supplemental instruction with intensive reading, writing, and discussion.

Department of Exercise Science and Physical Education

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REGENTS' PROFESSOR
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SENIOR LECTURER
LANDERS

LECTURER
PRIDE

EXERCISE SCIENCE/PHYSICAL EDUCATION—B.S.

The B.S. degree in Exercise Science/Physical Education consists of 42 semester hours, including 21 semester hours of required EPE core courses (EPE 110 may be repeated for credit). The remaining 21 semester hours of EPE and other courses are prescribed by the specific concentration the student selects.

The required EPE core courses are as follows:

EPE 110 Movement Analysis Laboratory.................................6
EPE 200 Introduction to Exercise Science and Physical Education...............................................3
EPE 335 Biomechanics.........................................................3
EPE 340 Physiology of Exercise .............................................3
EPE 345 Motor and Developmental Learning.........................3
EPE 352 Psychosocial Aspects of Physical Activity...............3
Total .....................................................................................21

Each EPE core course has specific prerequisite courses that must be taken before taking the respective core course. These prerequisite courses include the following:

BIO 201 Human Anatomy and Physiology I (6).................4
BIO 202 Human Anatomy and Physiology I(6)....................4
CHM 101 Introductory Chemistry SQ......................................4
MAT 117 College Algebra MA..............................................3
PGS 101 Introduction to Psychology SB...............................3
PHY 111 General Physics SQ*..............................................3
Total ..........................................................................................21

* Both PHY 111 and 113 must be taken to secure SQ credit.

All prerequisite and EPE courses must be completed with a minimum grade of “C.” The requirements for the specific concentrations are described below.

Majors must elect either the exercise science or physical education concentration.

Exercise Science Concentration. Candidates for the exercise science concentration must complete 21 semester hours beyond the core courses in the major field, at least 12 of which must carry EPE prefixes, be upper-division courses, and concern the theoretical subjects of the core. The remaining nine semester hours may carry either EPE prefixes or prefixes from related disciplines selected with the advice and consent of a faculty advisor. Activity courses may not be used to fulfill part of the 21 semester hour requirement. No more than six semester hours may be in independent study courses.

Physical Education Concentration. Candidates must complete 21 semester hours beyond the EPE core courses, 12 of which must carry EPE prefixes from the required course list below.

EPE 361 Physical Education in the Secondary School...........3
EPE 376 Physical Education for the Elementary School...........3
EPE 382 Physical Education for the Atypical Student .............3
EPE elective*........................................................................3
Total ..........................................................................................12

* See advisor for approved electives.

The remaining nine semester hours of related course work can carry either EPE, psychology, special education, child development, and/or education prefixes. Activity courses (EPE 110) may be used to fulfill part of the 21-semester-hour requirement (additional four semester hours maximum). No more than six semester hours may be taken in internship. Internship experiences may only be in elementary and secondary school teaching and coaching settings. A maximum of six semester hours may be in independent study.

EXERCISE SCIENCE/PHYSICAL EDUCATION MINOR

The minor in Exercise Science/Physical Education consists of the core sequence in exercise science and physical education as follows, plus all prerequisite courses:

EPE 110 Movement Analysis Laboratory..............................6
EPE 200 Introduction to Exercise Science and Physical Education ..............................................3
EPE 335 Biomechanics.........................................................3
EPE 340 Physiology of Exercise ...........................................3
EPE 345 Motor and Developmental Learning.........................3
EPE 352 Psychosocial Aspects of Physical Activity.............3
Total ..........................................................................................21

SECONDARY EDUCATION—B.A.E.

Physical Education. Candidates for the B.A.E. degree are required to complete the following courses in physical education in addition to the required EPE core courses:

EPE 361 Physical Education in the Secondary School...........3
EPE 376 Physical Education for the Elementary School...........3
EPE 382 Physical Education for the Atypical Student .............3
EPE 480 Methods of Teaching Physical Education.................3
EPE elective*........................................................................3
Total ..........................................................................................15

* See an advisor for approved electives.

Students must also complete a four-semester Physical Education Teacher Preparation Program professional sequence in the College of Education (38 semester hours). Entry into this degree program requires filing an application, passing scores on a Pre-Professional Skills Test (PPST) or American College Test (ACT), 56 semester hours of completed university study, and a minimum GPA of 2.50. See “College of Education,” page 178, for additional requirements.

GRADUATE PROGRAMS

The faculty in the Department of Exercise Science and Physical Education offer programs leading to the Master of Physical Education degree and the M.S. degree in Exercise Science/Physical Education. The department also participates with the Graduate College in the program leading to the Ph.D. degree in Exercise Science and with the College of Education and the Graduate College in the program leading to the Ph.D. degree in Curriculum and Instruction with a concentration in physical education. See the Graduate Catalog for requirements.

EXERCISE SCIENCE/PHYSICAL EDUCATION (EPE)

EPE Note 1. 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.

EPE Note 2. Physical education activity classes (EPE 105, 205, 305, 310) may not be taken for audit. Excessive absences and/or tardiness are considered disruptive behavior.

EPE 100 Introduction to Health and Wellness. (3)
fall, spring, summer
Current concepts in health, exercise, and wellness. Emphasis placed on personal health, theories, attitudes, beliefs, and behaviors. Cross-listed as EXW 100/HES 100. Credit is allowed only for EPE 100 or EXW 100 or HES 100.

General Studies: SB

EPE 105 Physical Education Activity. (1)
fall, spring, summer
Beginning instruction in a wide variety of sports such as aerobics, aquatics, racquet sports, physical conditioning, and golf. 3 hours per week. “Y” grade only. May be repeated for credit. Fee. See EPE Notes 1, 2.
EPE 110 Movement Analysis Laboratory. (1–2)  
fall, spring, summer  
Practical application of biomechanical, physiological, psychological, and learning principles in the analysis of skill acquisition and performance. May be repeated for credit. Fee. See EPE Note 1. Prerequisites: EPE 105 proficiency; ESPE major.

EPE 191 First-Year Seminar. (1–3)  
fall and spring  

EPE 200 Introduction to Exercise Science and Physical Education. (3)  
fall, spring, summer  
Introduction to the disciplines and professions associated with ESPE, including an overview of historical and philosophical foundations.

EPE 205 Physical Education Activity. (1)  
fall, spring, summer  
Intermediate levels. Continuation of EPE 105. 3 hours per week. May be repeated for credit. Fee. See EPE Notes 1, 2.

EPE 283 Prevention and Care of Athletic Injuries. (3)  
fall  
Taping, injury recognition, emergency care, and observation procedures in athletic training. Prerequisites: BIO 201, 202.

EPE 290 Sports Officiating. (3)  
fall  
Rules and mechanics of officiating used in football, basketball, and volleyball.

EPE 292 Sports Officiating. (3)  
spring  
Rules and mechanics of officiating used in softball (slow and fast pitch), baseball, and track and field.

EPE 305 Physical Education Activity. (1)  
fall, spring, summer  
Advanced levels. Continuation of EPE 205, with instructor’s approval. 3 hours per week. May be repeated for credit. Fee. See EPE Notes 1, 2.

EPE 310 Collegiate Sports. (1)  
fall and spring  
Participation in men’s or women’s intercollegiate competition. May be repeated for 4 credits, 1 per year; “Y/E” grade.

EPE 334 Functional Anatomy and Kinesiology. (3)  
spring  
Muscles, bones, joints, and nerves and how they produce movement. Emphasis on muscle origins, insertions, actions, and innervations. Lecture, lab. Prerequisite: BIO 201.

EPE 335 Biomechanics. (3)  
fall, spring, summer  
Basic anatomical and mechanical principles applied to human movement. Emphasis placed on kinematic and kinetic concepts. Lecture, recitation, lab. Fee. Prerequisites: BIO 201; MAT 117; PHY 111.

EPE 340 Physiology of Exercise. (3)  
fall, spring, summer  
Physiological mechanisms of acute responses and chronic adaptations to exercise. Lecture, recitation, lab. Fee. Prerequisites: BIO 201, 202; CHM 101.

EPE 345 Motor and Developmental Learning. (3)  
fall, spring, summer  
Principles of motor skill acquisition across the life span, focusing on the learner and the learning environment. Lecture, recitation, lab. Fee. Prerequisites: BIO 201; PGS 101.

EPE 348 Psychological Skills for Optimal Performance. (3)  
fall, spring, summer  
Applies psychological techniques and their use to improve effectiveness and performance in sport and related areas.  
General Studies: SB

EPE 352 Psychosocial Aspects of Physical Activity. (3)  
fall, spring, summer  
Interrelationships between physical activity and psychosocial variables, including socialization, cultural values, aggression, and motivation. Includes the psychological benefits of physical activity and exercise adherence. Lecture, recitation. Prerequisite: PGS 101.  
General Studies: SB, C

EPE 361 Physical Education in the Secondary School. (3)  
fall and spring  
Current trends and theories, such as elective programs, coed classes, legal issues, contract teaching, curriculum, and administration.

EPE 370 Advanced First Aid. (3)  
not regularly offered  
Assessment, management, treatment of wounds, injuries, shock, poisoning, burns, sudden illness, emergency rescue, and cardiopulmonary resuscitation. Lecture, lab. Fee.

EPE 376 Physical Education for the Elementary School. (3)  
fall and spring  
Scope and values of physical education in the elementary school. Methods, materials, and practice in teaching activities for primary, intermediate, and upper grades.

EPE 382 Physical Education for the Atypical Student. (3)  
fall and spring  
Teaching individuals with handicapping conditions physical skills and activities. Prerequisites: BIO 201, 202.

EPE 412 Biomechanics of the Skeletal System. (3)  
fall  
Biomechanics of tissues, structures, and major joints of the musculoskeletal system. Discussion of injury mechanisms. Lecture, discussion, some labs. Prerequisite: EPE 335 or instructor approval.

EPE 413 Qualitative Analysis in Sport Biomechanics. (3)  
spring  
Develops systematic approach for detecting and correcting errors in human performance using anatomical and mechanical principles. Lecture, lab. Prerequisite: EPE 335.

EPE 414 Electromyographic Kinesiology. (3)  
fall  
Muscular contributions to human movement, muscle mechanics, electrophysiological basis, and practical application of electromyography. Lecture, discussion. Prerequisites: EPE 335, 340; instructor approval.

EPE 440 Exercise Biochemistry. (3)  
fall  
Study of bioenergetics and metabolism of cellular (skeletal muscle, heart, and liver) organelles and proteins during exercise. Prerequisite: EPE 340.

EPE 441 Physiology of Women in Sport. (3)  
spring  
General Studies: L

EPE 443 Exercise Endocrinology. (3)  
spring  
Discussions of current research and theory concerning hormonal changes during exercise. Lecture, discussion. Prerequisite: EPE 340 or instructor approval.  
General Studies: L

EPE 444 Metabolic Adaptations to Exercise Training. (3)  
fall, spring, summer  
Examines physiologic adaptations to exercise training as they relate to metabolism and tissue functions. Prerequisite: EPE 340.

EPE 448 Applied Sport Psychology. (3)  
spring  
Psychological theories and techniques applied to sport to enhance the performance and personal growth of athletes and coaches. Lecture, discussion. Prerequisite: EPE 352 (or its equivalent).  
General Studies: L

EPE 452 Exercise Psychology. (3)  
spring  
Contemporary research and theory as related to human behavior and health in an exercise setting. Prerequisite: EPE 352.  
General Studies: SB

EPE 460 Theory of Strength Training. (3)  
spring  
Research and theories on developing muscular strength; programs for developing muscular strength. Lecture, discussion. Prerequisites: EPE 335, 340.  
General Studies: L

EPE 478 Student Teaching in Secondary Schools. (3–12)  
fall and spring  
Practice of teaching. Relationship of practice and theory in teaching. Prerequisite: two complete semesters of block (or its equivalent).
EPE 480 Methods of Teaching Physical Education. (3)
fall and spring
Methods of instruction, organization, and presentation of appropriate
content in elementary and secondary physical education. Concurrent
with student teaching or instructor approval. Prerequisites: EPE 361, 376.
EPE 484 Internship. (6)
not regularly offered
EPE 485 Advanced Techniques of Athletic Training. (3)
spring
Advanced course in athletic training designed for students seeking
NATA certification. Emphasis on therapeutic modalities and rehabilita-
tion procedures. Prerequisites: EPE 283, 370; CPR certification.
EPE 500 Research Methods. (3)
fall
Introduction to the basic aspects of research, including problem selection,
literature review, instrumentation, data handling, methodology,
and the writing of research reports and articles.
EPE 501 Research Statistics. (3)
spring
Statistical procedures; sampling techniques; exercise testing, exercise
prescription, hypothesis testing, and experimental designs as they relate to research publications. Prerequisite: EPE 340.
EPE 505 Applied Exercise Physiology Techniques. (3)
fall
Investigative techniques used in the applied exercise physiology labora-
EPE 510 Introduction to Biomechanics Research Methods. (3)
fall
Application of mechanics to human movement analysis. Includes consid-
eration of two-dimensional imaging techniques, force measurement,
electromyography, and data processing methods. Lecture, discussion, some labs. Prerequisite: EPE 335 or instructor approval.
EPE 520 Sport Psychology. (3)
fall
Current research in sport psychology with an emphasis on performance
enhancement. Includes questionnaire, psychophysiological, and behavioral research methods. Lecture, discussion. Prerequisites: EPE 448, 500.
EPE 521 Motor Development, Control, and Learning. (4)
spring
Theory and research on motor skill acquisition, including learning/control
and development (i.e., growth, children and exercise, and develop-
ment learning). Lecture, discussion, some labs. Prerequisites: EPE
345, 500, 501.
EPE 522 Exercise Psychology. (3)
spring
Contemporary research and theory as related to human behavior and health in an exercise setting. Lecture, discussion. Prerequisite: EPE 500.
EPE 530 Exercise Physiology. (3)
fall
Immediate and long-term adaptations to exercise with special refer-
cence to training and the role of exercise in cardiovascular health. Pre-
requisite: EPE 340.
EPE 531 Physiology of Women in Sport. (3)
spring
Physiological aspects of women engaging in physical activity. Empha-
sizes factors affecting performance and health throughout life. Pre-
requisite: EPE 340.
EPE 561 Administration of Athletics. (3)
not regularly offered
Managing an athletic program, including financing, budget policies,
staging, and promotion of athletic contests, schedules, travel insur-
ance, and current athletic trends.
EPE 570 Programs and Special Topics in Adapted Physical Education. (3)
fall
Contemporary adapted, developmental, remedial, and corrective
physical education programs; understanding of principles, problems,
and recent developments in this area.
EPE 572 Trends and Issues in Physical Education. (3)
spring
Literature, research, and practices in contemporary physical educa-
tion, including finances, Title IX, teaching and coaching philosophies,
school organization, and nonteaching physical education programs.
EPE 573 Curriculum and Instruction in Secondary Physical Education. (3)
fall
Current curriculum and instruction practices and research in secondary
school physical education. Prerequisite: ESPE major or teaching experience.
EPE 574 Analysis of Teaching Behavior in Sport and Physical Education. (3)
not regularly offered
Use of systematic, direct observation techniques in analyzing and eval-
uating instruction in sport and physical education. Lecture, lab.
EPE 576 Physical Education for Elementary School Children. (3)
fall
Current practices and research pertaining to elementary school physical
education programs.
EPE 578 Student Teaching in Secondary Schools. (6–12)
fall and spring
Practice of teaching. Relationship of theory and practice in teaching. Prerequisite: completion of all required course work (or its equivalent)
prior to student teaching.
EPE 599 Thesis. (1–12)
not regularly offered
EPE 610 Advanced Topics in Biomechanics. (3)
spring
Three-dimensional imaging techniques, data analysis theory, and inte-
gration of biomechanics research tools; includes original research
project. Lecture, discussion, some labs. Prerequisite: EPE 510 or instructor approval.
EPE 620 Developmental Motor Skill Acquisition. (3)
spring in odd years
Cognitive-motor theories of learning/performance applied to children’s
motor skill acquisition. Study of knowledge development and research
analysis/techniques. Lecture, discussion. Prerequisite: EPE 521.
EPE 621 Motor Learning/Control. (3)
fall
Discussion of contemporary research issues in motor learning and
control. Includes behavioral and neurophysiological issues. Lecture,
discussion. Prerequisite: EPE 521.

HEALTH SCIENCE (HES)

HES 100 Introduction to Health and Wellness. (3)
fall, spring, summer
Current concepts in health, exercise, and wellness. Emphasis placed
on personal health, theories, attitudes, beliefs, and behaviors. Cross-
listed as EPE 100/EXW 100. Credit is allowed for only EPE 100 or
EXW 100 or HES 100.
General Studies: SB

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation
requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed
in this catalog, see “Classification of Courses,” page 51.
**Department of Family and Human Development**

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**PROFESSORS**  
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**SENIOR LECTURER**  
WEIGAND

**LECTURER**  
BODMAN

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**FAMILY AND HUMAN DEVELOPMENT—B.S.**

For the B.S. degree in Family and Human Development at ASU Main, students must pursue the concentration in family studies/child development.

**Family Studies/Child Development**

The concentration in family studies/child development consists of the following core courses:

- **CDE 232 Human Development**
- **CDE 430 Infant/Toddler Development in the Family**
- **CDE 498 Pro-Seminar**
- **FAS 331 Marriage and Family Relationships**
- **FAS 361 Introduction to Family/Child Research Methods**
- **FAS 370 Family Ethnic and Cultural Diversity**
- **FAS 431 Parent-Adolescent Relationships**
- **FAS 435 Advanced Marriage and Family Relationships**
- **FAS 440 Fundamentals of Marriage and Family Therapy**

Total: 30 hours

In addition, 12 hours of electives must be taken from the following:

- **CDE 337 Early Childhood Intervention**
- **CDE 338 Child Development Practicum**
- **CDE 437 Observational and Naturalistic Methods of Studying Children**
- **CDE 444 Children and Poverty**
- **CDE 498 Pro-Seminar**
- **FAS 330 Personal Growth in Human Relationships**
- **FAS 332 Human Sexuality**
- **FAS 390 Supervised Research Experience**
- **FAS 432 Family Development**
- **FAS 436 Conceptual Frameworks in Family Studies**
- **FAS 484 Internship**

Total: 36 hours

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**FAMILY AND HUMAN DEVELOPMENT MINOR**

The minor in Family and Human Development consists of 18 semester hours in which students specialize in family studies/child development.

At least 12 of the 18 hours must be in upper-division courses.

Students take the following courses:

- **CDE 232 Human Development**
- **CDE 337 Early Childhood Intervention**
- **FAS 331 Marriage and Family Relationships**
- **FAS 440 Fundamentals of Marriage and Family Therapy**

Total: 12 hours

Two courses (or six semester hours) must be selected from the following:

- **CDE 430 Infant/Toddler Development in the Family**
- **CDE 444 Children and Poverty**
- **CDE 498 Pro-Seminar**
- **FAS 370 Family Ethnic and Cultural Diversity**
- **FAS 431 Parent-Adolescent Relationships**

**SECONDARY EDUCATION—B.A.E.**

*Family and Human Development (Home Economics)*

The major teaching field consists of 42 semester hours in family and human development and six hours in interior design. Major courses required are as follows:

- **CDE 232 Human Development**
- **CDE 337 Early Childhood Intervention**
- **FAS 330 Personal Growth in Human Relationships**
- **FAS 331 Marriage and Family Relationships**
- **FAS 431 Parent-Adolescent Relationships**
- **FRD 451 Field Experience**
- **HEE 461 Presentations in Home Economics**
- **HEE 481 Teaching Occupational Home Economics**
- **NTR 100 Introductory Nutrition**
- **NTR 142 Applied Food Principles**

Total: 31–43 hours

Also required are two interior design courses.

The College of Education has additional requirements for teacher certification: Arizona Teacher Proficiency Exam (professional knowledge only); 35 hours within the Professional Teacher Preparation Program; and the following courses:

- **POS 110 Government and Politics**
- **POS 310 American National Government**
- **POS 311 Arizona Constitution and Government**
- **POS 417 The Arizona Political System**

Applications to this program are not being accepted at this time.

**GRADUATE PROGRAMS**

The faculty in the Department of Family and Human Development offer programs leading to the M.S. and Ph.D. degrees. See the *Graduate Catalog* for requirements.
CHILD DEVELOPMENT (CDE)
CDE 232 Human Development. (3)
fall, spring, summer
Lifespan development from conception through adulthood, with emphasis on family influences. Recognition of individuality within the universal pattern of development. Prerequisites: PGS 101; SOC 101.
General Studies: L, SB
CDE 337 Early Childhood Intervention. (3)
fall
Explores how child development theory affects practice with children and families, emphasizing development of young children and early intervention. Prerequisite: CDE 232 (or its equivalent).
CDE 338 Child Development Practicum. (2–4)
fall and spring
Supervised practicum in the Child Development Lab preparing students for work in child care centers and agencies serving young children and families. Lab. Pre- or corequisite: CDE 337.
CDE 430 Infant/Toddler Development in the Family. (3)
fall and spring
Examination of the development of infants/toddlers, the socialization processes of families, and the interactions of these processes. Prerequisite: CDE 232 (or its equivalent).
General Studies: SB
CDE 437 Observational and Naturalistic Methods of Studying Children. (3)
not regularly offered
In-depth examination of implementing observational and naturalistic studies of children in a variety of settings. 2 hours lecture, 3 hours lab. Prerequisites: CDE 430; 6 hours in psychology.
General Studies: L, SB
CDE 444 Children and Poverty. (3)
fall
Impact that poverty has on children and their families. 2 hours lecture, 3 hours lab. Prerequisites: CDE 232 (or its equivalent); 6 hours in upper-division social sciences.
CDE 498 Pro-Seminar. (3)
not regularly offered
CDE 499 Individualized Instruction. (3)
not regularly offered
CDE 531 Theoretical Issues in Child Development. (3)
spring
Major developmental theories, related research, and their application to family interaction. Prerequisites: both CDE 430 and 437 (or their equivalents) or only instructor approval.
CDE 533 Research Issues in Child Development. (3)
spring
In-depth exploration and critique of research focusing on child development in a family setting. Prerequisites: CDE 531; FAS 500.
CDE 534 Applied Child Development. (3)
spring
Integration of research and theory on child development, risk, and resilience to understand developmental problems and provide a foundation for intervention strategies. Prerequisites: CDE 531; FAS 500.
CDE 634 Advanced Applied Child Development. (3)
spring
Advanced training in research and theory-based approaches to developing and evaluating prevention programs for children at risk. Prerequisite: CDE 534 or instructor approval.

FAMILY STUDIES (FAS)
FAS 301 Introduction to Parenting. (3)
fall and spring
Integrated approach to understanding parenting and parent-child interactions. Television course. Prerequisites: PGS 101; SOC 101 (or its equivalent).
FAS 330 Personal Growth in Human Relationships. (3)
tall, spring, summer
Personal development and behavior as related to competency in interpersonal relationships within the family. Processes of family interaction. Prerequisites: PGS 101; SOC 101 (or its equivalent).
General Studies: L
FAS 331 Marriage and Family Relationships. (3)
tall, spring, summer
Issues, challenges, and opportunities relating to present-day marriage and family living. Factors influencing interrelations within the family. Prerequisite: course in psychology or sociology.
General Studies: SB
FAS 332 Human Sexuality. (3)
tall and spring
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 101.
General Studies: SB
FAS 361 Introduction to Family/Child Research Methods. (3)
tall and spring
Examines basic methods applied to family/child research, critiques current research literature, and applies methods in current topics. Prerequisites: CDE 232; FAS 331.
General Studies: L, SB
FAS 370 Family, Ethnic, and Cultural Diversity. (3)
tall and spring
Integrative approach to understanding historical and current issues related to the structure and internal dynamics of diverse American families. Lecture, discussion. Cross-listed as AFS 370. Credit is allowed for only AFS 370 or FAS 370. Prerequisite: PGS 101 or SOC 101.
General Studies: SB, C
FAS 390 Supervised Research Experience. (1–3)
tall, spring, summer
Practical, firsthand 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 before registration.
FAS 431 Parent-Adolescent Relationships. (3)
tall
Dynamics of the relationships between parents and adolescents. Developmental characteristics of adolescence and the corresponding adult stage. Prerequisites: CDE 232; FAS 331.
General Studies: SB
FAS 432 Family Development. (3)
not regularly offered
Normative changes in families over time from formation until dissolution. Emphasis on the marital subsystem in middle and later years. Prerequisites: both CDE 232 and FAS 331 or only instructor approval.
FAS 435 Advanced Marriage and Family Relationships. (3)
tall and spring
Recent research, issues, and trends relating to marriage and family interaction. Influence of family composition, physical environment, family patterns, and values on family dynamics. Prerequisites: FAS 331, 361.
General Studies: L, SB
FAS 436 Conceptual Frameworks in Family Studies. (3)
spring
Approaches to study families focusing on systems, interactional, exchange, conflict, and developmental frameworks. Applications to diverse individual and family situations. Prerequisites: CDE 232; FAS 331, 361.
FAS 440 Fundamentals of Marriage and Family Therapy. (3)
tall and spring
Introduction to the fundamental orientations of marriage and family therapy.
FAS 484 Internship. (1–3)
tall and spring
FAS 498 Pro-Seminar. (3)
tall and spring

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
FAS 499 Individualized Instruction. (3)  
Fall and spring

FAS 500 Research Methods. (4)  
Fall
Purposes of research. Experimental design, methods of data collection, and thesis proposal development. Includes practical application research laboratory. 3 hours lecture, 3 hours lab.

FAS 530 Introduction to Marriage and Family Therapy. (3)  
Fall
Introduction of major marriage and family therapy orientations. Review history, theory, application, and outcome research for each orientation. Prerequisite: admission to graduate program in FRHD with a concentration in family studies or instructor approval.

FAS 531 Family Theory Development. (3)  
Spring
Historical and current approaches to theory development, evaluation, and application in family studies. Prerequisite: FAS 435 or instructor approval.

FAS 536 Dysfunctional Marriage and Family Relationships. (3)  
Not regularly offered
Critical review of current theory and empirical evidence connecting marital and family interaction patterns with aberrant behavior. Prerequisite: PGS 466 or PSY 573 (or its equivalent) or instructor approval.

FAS 537 Interpersonal Relationships. (3)  
Fall
Critical examination of current theoretical and research developments in the area of interpersonal relationships. Emphasizes applications for research and intervention. Prerequisite: FAS 435 (or its equivalent) or instructor approval.

FAS 538 Advanced Techniques in Marriage and Family Therapy. (3)  
Not regularly offered
In-depth review of assumptions and advanced techniques associated with contemporary marriage and family therapy approaches. Prerequisite: a graduate-level course in marriage and family therapy or instructor approval.

FAS 539 Research Issues in Family Interaction. (3)  
Fall
Critical review of current and past research in the area of family dynamics. Emphasizes interactional processes within the family. Prerequisite: FAS 435 (or its equivalent) or instructor approval.

FAS 540 Assessment in Marriage and Family Therapy. (3)  
Spring
Assessment and outcome evaluation of couples and families involved in marital and family therapy. Lecture, lab. Prerequisites: FAS 500 (or its equivalent); PSY 530; instructor approval.

FAS 580 Marriage and Family Therapy Practicum. (1–12)  
Fall and Spring
Supervised clinical experience in marriage and family therapy. Lecture, lab. Possible topics: (a) First semester. (3) (b) Second semester. (3) (c) Third semester. (3) Prerequisite: instructor approval.

FAMILY AND HUMAN DEVELOPMENT (FRD)

FRD 451 Field Experience. (1–12)  
Not regularly offered
Supervised field placement in the area of student’s concentration with a community business or agency. Students must make arrangements with instructor 1 semester in advance of enrollment. Prerequisites: completion of 60 hours; instructor approval.

HOME ECONOMICS EDUCATION (HEE)

HEE 461 Presentations in Home Economics. (3)  
Not regularly offered
Presentation and demonstration techniques in teaching home economics. Development of audiovisual materials for home economics content areas. Prerequisites: junior standing; instructor approval.

HEE 480 Methods of Teaching Home Economics. (3–4)  
Not regularly offered
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.

HEE 481 Teaching Occupational Home Economics. (3)  
Not regularly offered
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: Family and Human Development major or minor.

Department of Geography

Brendán Ó hUallacháin  
Chair  
(SCOB 330) 480/965-7533  
geography.asu.edu

PROFESSORS

ARREOLA, BALLING, BRAZEL, BURNS, CERVENY, COMEAUX, DORN, GOBER, Ó HUALLACHÁIN, PASQUALETTI, ZEHNDER

ASSOCIATE PROFESSORS

FALL, KUBY, McHUGH

ASSISTANT PROFESSORS

EDSALL, ELLIS, SIERRA-MALDONADO, WENTZ

Geography is a discipline that brings together the physical and human dimensions of the world in the study of places, people, and environments. The mission of the Department of Geography is the creation, dissemination, and application of geographic knowledge and scholarship in a liberal arts and sciences tradition.

Undergraduate students may choose to pursue a B.A. degree in Geography, B.S. degree in Geography, B.A.E. degree in Secondary Education, or minor in Geography. A grade of “C” or higher is necessary in all required Department of Geography courses. Both B.A. and B.S. degrees in Geography consist of a minimum of 45 semester hours. A minor consists of 18 semester hours.

GEOGRAPHY—B.A.

A student choosing a B.A. degree in Geography may be interested in a liberal arts and sciences focus on the breadth of the field. A B.A. degree may also focus on a geographic region. In either case, the student crafts an individualized program of study in consultation with an advisor.

The B.A. degree consists of courses in core geographic knowledge (10–11 semester hours), geographic skills (12 hours), a regional course (three hours), and electives (12 hours), for a minimum of 37 hours in geography. At least 18 hours in geography must be in upper-division courses. The remaining nine hours are made up of electives from geography courses or related fields of study, chosen in consultation with an advisor.

Core Geographic Knowledge

<table>
<thead>
<tr>
<th>Course</th>
</tr>
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<tbody>
<tr>
<td>GCU 102 Introduction to Human Geography SB</td>
</tr>
<tr>
<td>G CU 121 World Geography SB, G</td>
</tr>
<tr>
<td>GPH 111 Introduction to Physical Geography SQ</td>
</tr>
<tr>
<td>or GPH 411 Physical Geography (3)</td>
</tr>
</tbody>
</table>

Total: 10–11

Core Geographic Skills

<table>
<thead>
<tr>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCU 495 Quantitative Methods in Geography CS</td>
</tr>
</tbody>
</table>
### Geographic Region

Choose one of the courses below, in consultation with an advisor.

- **GCU 322 Geography of the U.S. and Canada**  
  SB, C (3)
- **GCU 323 Geography of Latin America**  
  SB, G (3)
- **GCU 325 Geography of Europe**  
  SB, G (3)
- **GCU 326 Geography of Asia**  
  SB, G (3)
- **GCU 327 Geography of Africa**  
  SB, G (3)
- **GCU 328 Geography of Middle East and North Africa**  
  SB, G (3)
- **GCU 332 Geography of Australia and Oceania**  
  SB, G (3)
- **GCU 344 Geography of Hispanic Americans**  
  SB, C (3)
- **GCU 421 Geography of Arizona and Southwestern United States**  
  SB, C (3)
- **GCU 423 Geography of South America**  
  SB, G (3)
- **GCU 424 Geography of Mexico and Middle America**  
  SB, G (3)
- **GCU 425 Geography of the Mexican American Borderland**  
  L/SB, G (3)
- **GCU 426 Geography of Russia and Surroundings**  
  SB, G (3)
- **GCU 433 Geography of Southeast Asia**  
  (3)
- **GPH 433 Alpine and Arctic Environments**  
  G (3)

A student can design, in consultation with an advisor, a general B.A. degree in Geography. In addition, there are three cooperative programs whereby a student receives a B.A. degree in Geography and an emphasis in Asian Studies, Southeast Asian Studies, or Latin American Studies.

### Asian and Southeast Asian Emphasis

Students majoring in Geography may elect to pursue an Asian or Southeast Asian emphasis combining courses from the major with selected courses of wholly Asian or Southeast Asian content. The Asian program requires 30 semester hours of 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 20 semester hours or equivalent in Chinese, Indonesian, Japanese, Thai, or Vietnamese. The Southeast Asian Studies Certificate is awarded to Geography students who emphasize regional studies specialization in Geography and one year of Indonesian, Thai, or Vietnamese. For more information, see “Asian Studies,” page 324, and “Southeast Asian Studies,” page 327.

### Latin American Studies Emphasis

Students majoring in Geography may elect to pursue a Latin American studies concentration combining courses from the major with selected outside courses of wholly Latin American content. 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 Department of 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 Latin American Studies Center. See “Latin American Studies,” page 326, for more information.

### GEOGRAPHY—B.S.

The B.S. degree consists of classes in core geographic knowledge (10–11 semester hours), core geographic skills and core geographic techniques (15 hours), and electives (12 hours)—for a minimum of 37 hours in geography. At least 18 hours in geography must be in upper-division courses. The remaining nine hours are to be made up of electives from geography courses or related fields of study, chosen in consultation with an advisor.

#### Core Geographic Knowledge

- **GCU 102 Introduction to Human Geography**  
  SB (3)
- **GCU 121 World Geography**  
  SB, G (4)
- **GPH 111 Introduction to Physical Geography**  
  SQ (4)
- **GPH 491 Geographic Research Methods**  
  (3)

Total: ................................................................. 10–11

#### Core Geographic Skills

- **GCU 495 Quantitative Methods in Geography**  
  CS (3)
- **GCU 496 Geographic Research Methods**  
  L (3)
- **GPH 371 Cartography**  
  CS (3)
- **GPH 491 Geographic Field Methods**  
  (3)

Total: ................................................................. 12

#### Core Geographic Techniques

Choose one of the courses below, in consultation with an advisor.

- **GPH 372 Air Photo Interpretation**  
  (3)
- **GPH 373 Geographic Information Science I**  
  CS (3)
- **GPH 471 Cartographic Design**  
  CS (3)

Students seeking the B.S. degree take the required core of eight courses. The remaining four courses (12 hours) of geography electives and 9 hours of geography or related fields of study vary among the options available for a B.S. degree in Geography. There are two specific departmental concentrations: meteorology-climatology and urban studies. In addition, a student can design, in consultation with an advisor, an individualized B.S. degree emphasizing other areas within the major.

### Meteorology-Climatology Concentration

See an undergraduate advisor in the Department of Geography for the latest National Weather Service certification requirements. The required courses for the meteorology-climatology concentration include a minimum of 39 semester hours in geography plus eight hours of related mathematics:

#### Core Courses

- **GCU 102 Introduction to Human Geography**  
  SB (3)
- **GCU 121 World Geography**  
  SB, G (4)
- **GCU 495 Quantitative Methods in Geography**  
  CS (3)
- **GCU 496 Geographic Research Methods**  
  L (3)
- **GPH 111 Introduction to Physical Geography**  
  SQ (4)
- **GPH 371 Cartography**  
  CS (3)
- **GPH 373 Geographic Information Science I**  
  CS (3)
- **GPH 377 Geographic Information Science II**  
  CS (3)

or another three-hour techniques course if GPH 373 is taken to meet a core requirement.

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**NOTE:** For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
PHY 132 University Physics Laboratory II .............................................................. 1

Total .................................................................................................................. 10–11

* Three semester hours in transfer courses can also fulfill this requirement.

In conjunction with an advisor, students choose remaining credits from three groups of human, physical, and regional courses.

MINOR IN GEOGRAPHY

A minor in Geography is awarded to students who complete a minimum of 18 hours in geography. A letter grade of “C” or higher is required for all courses taken for the minor.

The following lower-division courses are required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCU 102</td>
<td>Introduction to Human Geography SB</td>
<td>3</td>
</tr>
<tr>
<td>GCU 121</td>
<td>World Geography SB, G*</td>
<td>4</td>
</tr>
<tr>
<td>GPH 111</td>
<td>Introduction to Physical Geography SQ</td>
<td>4</td>
</tr>
<tr>
<td>or GPH 411 Physical Geography (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPH 371</td>
<td>Cartography CS</td>
<td>3</td>
</tr>
<tr>
<td>or another three-hour techniques course if GPH 373 is taken to meet a core requirement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total .................................................................................................................. 6–7

The remaining courses are selected in conjunction with an advisor. At least one course should be a geographic skill, for example, map reading (GPH 271), cartography (GPH 371), air photo interpretation (GPH 372), geographic field methods (GPH 491), or a class in geographic information science (GPH 373). At least four courses should be upper-division classes in human, physical, or regional geography.

CULTURAL GEOGRAPHY (GCU)

GCU 102 Introduction to Human Geography. (3)  
*fall and spring*
Systematic study of human use of the earth. Spatial organization of economic, social, political, and perceptual environments. 
General Studies: SB

GCU 121 World Geography. (4)  
*fall and spring*
Description and analysis of areal variations in social, economic, and political phenomena in major world regions. 
General Studies: SB, G

GCU 141 Introduction to Economic Geography. (3)  
*fall*
Production, distribution, and consumption of various types of commodities of the world and relationships to the activities of humans. 
General Studies: SB, G
GCU 200 Orientation to Geography. (1)
fall
Basic introduction to the Department of Geography faculty, undergraduate graduation requirements, and possible jobs and skills in geography. Cross-listed as GPH 200. Credit is allowed for only GCU 200 or GPH 200.

GCU 240 Introduction to Southeast Asia. (3)
fall
Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/HST 240/POS 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.
General Studies: G

GCU 253 Introduction to Cultural and Historical Geography. (3)
not regularly offered
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.
General Studies: SB, G

GCU 294 Special Topics. (4)

Once a year
Topics include global awareness.

GCU 322 Geography of U.S. and Canada. (3)
fall
Spatial distribution of relevant physical, economic, and cultural phenomena in the United States and Canada.
General Studies: SB, C

GCU 323 Geography of Latin America. (3)
fall
Spatial distribution of relevant physical, economic, and cultural phenomena in South, Middle, and Caribbean America.
General Studies: SB, G

GCU 325 Geography of Europe. (3)

Once a year
Broad and systematic overview of Europe, emphasizing physical, economic, and cultural phenomena.
General Studies: SB, G

GCU 326 Geography of Asia. (3)
fall
Spatial distribution of relevant physical, economic, and cultural phenomena in Asia, excluding the former Soviet Union.
General Studies: SB, G

GCU 327 Geography of Africa. (3)
not regularly offered
Spatial distribution of relevant physical, economic, and cultural phenomena in Africa.
General Studies: SB, G

GCU 328 Geography of Middle East and North Africa. (3)
not regularly offered
Spatial distribution of relevant physical, economic, and cultural phenomena in the Middle East and North Africa. Prerequisite: GCU 121 or instructor approval.
General Studies: SB, G

GCU 332 Geography of Australia and Oceania. (3)

Once a year
Spatial distribution of relevant physical, economic, and cultural phenomena in Australia, New Zealand, and Pacific Islands.
General Studies: SB, G

GCU 344 Geography of Hispanic Americans. (3)
spring
Examines the homelands, migrations, settlements, landscapes, roles, and selected cultural traditions of Hispanic Americans.
General Studies: SB, C

GCU 350 The Geography of World Crises. (3)
fall and spring
Contemporary world crises viewed from a perspective of geographic concepts and techniques.
General Studies: SB, G

GCU 351 Population Geography. (3)
fall
Demographic patterns; spatial, temporal, and structural investigation of the relationship of demographic variables to cultural, economic, and environmental factors.
General Studies: SB, G

GCU 352 Political Geography. (3)
not regularly offered
Relationship between the sociophysical environment and the state.
General Studies: SB, G

GCU 357 Social Geography. (3)

Once a year
Environmental perception of individuals and groups. Stresses the spatial aspect of social and physical environments.
General Studies: SB

GCU 359 Cities of the World I. (3)
fall
Historical evolution of urban patterns and structures in the Middle East, India, Southeast Asia, China, Japan, and Europe.
General Studies: SB, G, H

GCU 360 Cities of the World II. (3)
not regularly offered
Historical evolution of urban patterns and structures in Latin America, North America, Sub-Saharan Africa, and Australasia.
General Studies: SB, G

GCU 361 Urban Geography. (3)
fall and spring
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.
General Studies: SB

GCU 364 Energy in the Global Arena. (3)
spring
Production, transportation, and consumption of energy, emphasizing the electric power industry and its environmental problems.
General Studies: SB, G

GCU 394 Special Topics. (1–4)

Fall and spring

GCU 421 Geography of Arizona and Southwestern United States. (3)
fall and spring
Geography of the Southwest with an emphasis on Arizona. Divided into physical geography, history, people, and economy.
General Studies: SB, G

GCU 423 Geography of South America. (3)
not regularly offered
Prerequisite: GCU 323 or instructor approval.
General Studies: SB, C

GCU 424 Geography of Mexico and Middle America. (3)

Once a year
Central America and Mexico. Prerequisite: GCU 323 or instructor approval.
General Studies: SB, G

GCU 425 Geography of the Mexican American Borderland. (3)
spring
Geography of a binational and bilingual region. Examination of settlement, boundary issues, ethnic subregions, population change, industrial development, and urban growth. Fee.
General Studies: L/SB, G

GCU 426 Geography of Russia and Surroundings. (3)
not regularly offered
Examines the geography of Russia and other post-Soviet states. Prerequisite: GCU 121 or instructor approval.
General Studies: SB, G

GCU 432 Geography of China. (3)
not regularly offered
Examines the physical, economic, cultural, social, demographic, agricultural, political, historical, and environmental aspects of the geography of China. Lecture, discussion.
General Studies: SB, G

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GCU 433 Geography of Southeast Asia. (3)
Spring
Examines the biophysical and social features of Southeast Asian nations and peoples. Prerequisite: GCU 326 or instructor approval.

GCU 441 Economic Geography. (3)
Once a year
Spatial distribution of primary, secondary, and tertiary economic and production activities. Prerequisite: GCU 141 or instructor approval.

General Studies: SB

GCU 442 Geographical Analysis of Transportation. (3)
Fall
Networks, modes, economics, and flows at the urban, national, and international scales. Prerequisite: GCU 141 or 441.

General Studies: SB

GCU 444 Geographic Studies in Urban Transportation. (3)
Spring
Current urban transportation issues in metropolitan Phoenix. Lecture, team project. Prerequisite: GCU 361.

General Studies: SB

GCU 453 Recreational Geography. (3)
Not regularly offered
Examines problems surrounding the organization and use of space for recreation. Introduces geographic field survey methods of data collection and analysis. Saturday field trips may be required.

GCU 455 Historical Geography of U.S. and Canada. (3)
Not regularly offered
Geographical perspective on the evolution of the United States and Canada from pre-Columbian times to early 20th century.

General Studies: SB, H

GCU 474 Public Land Policy. (3)
Not regularly offered
Geographic aspects of federal public lands, policy, management, and issues. Emphasis on western wilderness and resource development problems.

General Studies: SB

GCU 484 Internship. (3)
Fall and spring

GCU 494 Special Topics. (1–4)
Once a year
Possible topics:
(a) Geography of Phoenix. (3)

GCU 495 Quantitative Methods in Geography. (3)
Fall and spring
Statistical techniques applied to the analysis of spatial distributions and relationships. Introduction to models and theory in geography. Prerequisite: MAT 119.

General Studies: CS

GCU 496 Geographic Research Methods. (3)
Fall and spring
Scientific techniques used in geographic research. Prerequisites: GCU 495; GPH 371, 491.

General Studies: L

GCU 515 Human Migration. (3)
Fall
Economic, political, social, and geographic factors underlying population movements. Migration selectivity, streams and counter-streams, labor migration, and migration decision making. Lecture, seminar. Prerequisite: GCU 351 or instructor approval.

GCU 526 Spatial Land-Use Analysis. (3)
Not regularly offered
Determination, classification, and analysis of spatial variations in land-use patterns. Examines the processes affecting land-use change. Prerequisite: 15 hours in geography or instructor approval.

GCU 529 Contemporary Geographic Thought. (3)
Fall
Comparative evaluation of current philosophy concerning the nature and trends of geography. Prerequisites: 15 hours in geography; instructor approval.

GCU 585 Advanced Research Methods in Geography. (3)
Spring
Specialized research techniques and methodologies in economic, political, or cultural geography.

GCU 591 Seminar. (1–3)
Fall, spring, summer
Selected topics in economic, political, or cultural geography. Field trips may be required.

GCU 596 History of Geographic Thought. (3)
Not regularly offered
Historical development of geographic thought from pre-Greek days to the early 20th century.

GCU 599 Thesis. (6)
Fall and spring

PHYSICAL GEOGRAPHY (GPH)

GPH 111 Introduction to Physical Geography. (4)
Fall and spring
Spatial and functional relationships among climates, landforms, soils, water, and plants. Credit is allowed for only GPH 111 or 411. 3 hours lecture, 3 hours lab. Required field trips. Fee.

General Studies: SQ

GPH 200 Orientation to Geography. (1)
Fall
Basic introduction to the Department of Geography faculty, undergraduate graduation requirements, and possible jobs and skills in geography. Cross-listed as GCU 200. Credit is allowed for only GCU 200 or GPH 200.

GPH 210 Society and Environment. (3)
Fall
Examines the interaction between social processes, key environmental issues, and nature’s role as a resource at global and regional scales.

General Studies: G

GPH 211 Landform Processes. (3)
Spring
Geographic characteristics of landforms and earth-surface processes, emphasizing erosion, transportation, deposition, and implications for human management of the environment. Fee. Prerequisites: ENG 101 (or 105); GPH 111.

General Studies: L

GPH 212 Introduction to Meteorology. (3)
Fall
Fundamentals of weather and climate, including basic atmospheric processes and elements. Students whose curricula require a laboratory course must also register for GPH 214. Prerequisite: GPH 111 or instructor approval.

General Studies: SG (if credit also earned in GPH 214)

GPH 213 Introduction to Climatology. (3)
Spring
Fundamentals of meteorological/climatological analysis, including terminology and symbology. Recommended for meteorology/climatology program students. Prerequisite: instructor approval.

GPH 214 Introduction to Meteorology Laboratory. (1)
Fall
Introduction to basic meteorological/climatological data and measurements. 3 hours lab. Suggested concurrent enrollment in GPH 212.

General Studies: SG (if credit also earned in GPH 212)

GPH 215 Introduction to Climatology Laboratory. (1)
Spring
Fundamentals of meteorological/climatological map analysis and interpretation. Recommended for meteorology/climatology program students. May be taken concurrently with GPH 213. Prerequisite: instructor approval.

GPH 271 Maps and Map Reading. (3)
Once a year

GPH 314 Global Change. (3)
Fall
Response of Earth’s natural systems (atmosphere, hydrosphere, lithosphere, biosphere) to past environmental change, and effects of potential future changes.

General Studies: HU, G
GPH 370 Geographic Information Technologies. (3)  
fall and spring  
Introduction to modern geographic information technologies, including cartography, GIS, remote sensing, global positioning systems, and statistical analyses. Lecture, lab.

GPH 371 Cartography. (3)  
fall and spring  
Philosophy and practical aspects of map production; employs communications, symbolism, data manipulation, presentation, decision making, generalization, line work, lettering, digital media. Prerequisite: GPH 111.  
General Studies: CS

GPH 372 Air Photo Interpretation. (3)  
once a year  
Subset, remote sensing, includes: photography, films, aerial geometry, image components, stereoscopy, photogrammetry, ground truthing, interpret physical, cultural, economic, intelligence information. Prerequisite: GPH 211 or any Cultural Geography (GCU) course or instructor approval.

GPH 373 Geographic Information Science I. (3)  
fall  
History and basic aspects of GIS including map and data file structure, conversions, and synthesis with a computerized environment. Prerequisite: GPH 370.  
General Studies: CS

GPH 381 Geography of Natural Resources. (3)  
once a year  
Nature and distribution of natural resources and the problems and principles associated with their use.  
General Studies: G

GPH 394 Special Topics. (1–4)  
fall and spring  
Possible topics:  
(a) Geographic Information Science. (3)

GPH 401 Topics in Physical Geography. (1–3)  
once a year  
Open to students qualified to pursue independent studies. Field trips may be required. Prerequisite: instructor approval.

GPH 405 Energy and Environment. (3)  
spring  
Sources, regulatory and technical controls, distribution, and consequences of the supply and human use of energy. Prerequisite: physical or life sciences courses or instructor approval.

GPH 409 Synoptic Meteorology I. (4)  
fall  
Diagnostic techniques and synoptic forecasting. Includes techniques of weather analysis, map interpretation, and satellite and radar analysis. Prerequisites: MAT 270; PHY 131, 132.

GPH 410 Synoptic Meteorology II. (4)  
spring  
Diagnostic techniques and synoptic forecasting. Includes techniques of weather analysis, map interpretation, and satellite and radar analysis. Prerequisite: GPH 409.

GPH 411 Physical Geography. (3)  
once a year  
Introduction to physiography and the physical elements of the environment. Credit is allowed for only GPH 411 or 111. Field trips.

GPH 412 Physical Climatology. (3)  
once a year  
Physical processes in the earth-atmosphere system on regional and global scales; concepts and analysis of energy, momentum, and mass balances. Prerequisites: both GPH 212 and 213 or only instructor approval.

GPH 413 Meteorological Instruments and Measurement. (3)  
once a year  
Design and operation of ground-base and aerological weather measurement systems. Collection, reduction, storage, retrieval, and analysis of data. Required field trips. Prerequisites: both GPH 212 and 213 or only instructor approval.

GPH 414 Climate Change. (3)  
spring  
Survey of three climate research areas: paleoclimatology, theories (e.g., greenhouse warming), numerical modeling. Prerequisite: GPH 212 or instructor approval.

GPH 418 Landforms of the Western United States. (3)  
once a year  
Studies landforms and geomorphic processes in the western United States, including lecture, topographical maps, aerial photographs, satellite imagery, and field trips. Lecture, critical inquiry, laboratory, field work. Fee. Prerequisites: GPH 211 (or its equivalent); completion of General Studies L course.  
General Studies: L

GPH 422 Plant Geography. (3)  
not regularly offered  
Plant communities of the world and their interpretation, emphasizing North American plant associations. Cross-listed as PLB 422. Credit is allowed for only GPH 422 or PLB 422. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 or only GPH 111.

GPH 433 Alpine and Arctic Environments. (3)  
not regularly offered  
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. Required field trips. Prerequisite: GPH 111 or instructor approval.  
General Studies: G

GPH 471 Cartographic Design. (3)  
fall  
Advanced design using desktop mapping. Cartographic decision making, qualitative and quantitative symbol design, projections, color. Prerequisites: GPH 371 or instructor approval.  
General Studies: CS

GPH 473 Geographic Information Science II. (3)  
fall  
GIS as a basis for microcomputer spatial analysis and synthesis. Includes digitizing, database organization, spatial retrieval, and graphics. Prerequisite: GPH 373.  
General Studies: CS

GPH 474 Dynamic Meteorology I. (3)  
fall  
Large-scale atmospheric motion, kinematics, Newton’s laws, wind equation, baroclinics, vorticity, and the midlatitude depression. Prerequisites: GPH 213, 215; MAT 271; PHY 131, 132.

GPH 475 Dynamic Meteorology II. (3)  
spring  
Topics in climate dynamics. General circulation, numerical modeling, teleconnection phenomena, and surface-atmosphere interaction. Prerequisite: GPH 474 or instructor approval.

GPH 481 Environmental Geography. (3)  
once a year  
Problems of environmental quality, including uses of spatial analysis, research design, and field work in urban and rural systems. Required field trips. Prerequisite: instructor approval.

GPH 484 Geography Internship. (3)  
fall and spring  
Assist in teaching sixth-grade students a simplified version of GPH 111 using hands-on activities.

GPH 491 Geographic Field Methods. (3)  
spring and summer  
Field techniques, including use of aerial photos, large-scale maps, and fractional code system of mapping; urban and rural field analysis to be done off campus. Travel fees required. Fee. Prerequisites: GCU 102, 121; GPH 111.

GPH 511 Fluvial Processes. (3)  
once a year  
Geographical aspects of processes of river erosion, transportation, sedimentation; emphasizing spatial characteristics of forces, resistance, landforms, sediment; includes computer applications. Prerequisites: both GPH 111 (or GLG 101) and 211 (or GLG 362) or only instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
GLG 533 Snow and Ice. (3)
spring
Processes, distribution, climatic interactions of snow/ice emphasizing mass balance, snow stratigraphy/metamorphism and glacier/snowpack climatology. Lecture, field work. Prerequisite: instructor approval.

GPH 573 Computer Mapping and Graphics. (3)

once a year
Utilization of the digital computer in analysis and mapping of geographic data. Includes plotting, surficial display, compositing, and graphics. Field trips. Prerequisites: GPH 371; instructor approval.

GPH 575 Geographic Applications of Remote Sensing. (3)
not regularly offered
Uses imaging and nonimaging methods of remote acquisition of data, including satellite sensors, airborne radar, multiband scanning, conventional photographic sensors, and ground-based equipment. Required field trips. Prerequisites: GCU 585 (or GPH 491); GPH 372.

GPH 591 Seminar. (1–3)
fall and spring
Selected topics in physical geography. Field trips may be required.

GPH 596 Advanced Spatial Statistics. (3)
spring
Multivariate and advanced statistical techniques including Box-Jenkins modeling and spectral analysis. Project papers and presentations required. Seminar. Prerequisite: GCU 495 (or its equivalent).

GPH 599 Thesis. (6)
fall and spring

Department of Geological Sciences

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REGENTS’ PROFESSORS
BUSECK, GREELEY, MOORE

PROFESSORS
BURT, CHRISTENSEN, FARMER, FINK, HOLLOWAY, KNAUTH, LARIMER, PEACOCK, REYNOLDS, STUMP, TYBURCZY, WILLIAMS

ASSOCIATE PROFESSORS
O’DAY, SHARP

ASSISTANT PROFESSORS
ARROWSMITH, FOUC H, GARNERO, LESHIN, TANG

GEOLOGICAL SCIENCES—B.S.

The B.S. degree in Geological Sciences requires 39 semester hours including the following core courses or their equivalents:

GLG 101 Introduction to Geology I (Physical) SQ^1 G ......... 3
GLG 102 Introduction to Geology II (Historical) SG^2 H .............. 3
GLG 103 Introduction to Geology I—Laboratory SQ^1 .............. 1
GLG 104 Introduction to Geology II—Laboratory SG^2 .............. 1
GLG 310 Structural Geology ............................................. 3
GLG 321 Mineralogy ...................................................... 3
GLG 400 Geology Colloquium ........................................... 3
GLG 424 Petrology ....................................................... 3
GLG 435 Sedimentology .................................................. 1
GLG 451 Field Geology I .................................................. 3

GLG 452 Field Geology II .................................................. 3

Total ................................................................................... 27

1 Both GLG 101 and 103 must be taken to secure SQ credit.

2 Both GLG 102 and 104 must be taken to secure SG credit.

In addition, two of the following four branch courses must be taken:

GLG 335 Paleontology ....................................................... 3
GLG 418 Geophysics ......................................................... 3
GLG 470 Hydrogeology ....................................................... 3
GLG 481 Geochemistry ....................................................... 3

To complete the total required hours, other upper-division course s in geological sciences (excluding GLG 300 and 304) or courses in related fields listed as approved by the department may be taken. See “College Degree Requirements,” page 319.

Supporting courses required in related fields include:

CHM 113 General Chemistry SQ ........................................ 4
CHM 116 General Chemistry SQ ........................................ 4
MAT 270 Calculus with Analytic Geometry I MA ................. 4
MAT 271 Calculus with Analytic Geometry II MA .............. 4
MAT 272 Calculus with Analytic Geometry III MA ............. 4
or MAT 274 Elementary Differential Equations MA (3)
PHY 121 University Physics I: Mechanics SQ^1 ................. 3
PHY 122 University Physics Laboratory I SQ^1 ............... 1
PHY 131 University Physics II: Electricity and Magnetism SQ^2 .......... 3
PHY 132 University Physics Laboratory II SQ^2 .............. 1

Total ................................................................................... 28

1 Both PHY 121 and 122 must be taken to secure SQ credit.

2 Both PHY 131 and 132 must be taken to secure SQ credit.

MAT 290 Calculus I and MAT 291 Calculus II may be substituted for MAT 270, 271, and 272.

MINOR IN GEOLOGICAL SCIENCES

A minor in Geological Sciences is awarded to students who complete a minimum of 21 hours of geological science courses. Required courses are as follows:

GLG 101 Introduction to Geology I (Physical) SQ^1 G ........... 3
GLG 102 Introduction to Geology II (Historical) SG^2 H ........... 3
GLG 103 Introduction to Geology I—Laboratory SQ^1 ........... 1
GLG 104 Introduction to Geology II—Laboratory SG^2 ........... 1
GLG 310 Structural Geology ............................................... 3
GLG 321 Mineralogy ....................................................... 3
GLG 400 Geology Colloquium ........................................... 3

Total ................................................................................... 15

1 Both GLG 101 and 103 must be taken to secure SQ credit.

2 Both GLG 102 and 104 must be taken to secure SG credit.

The remaining six semester hours may be chosen among other upper-division geological sciences courses, except GLG 300 and 400, after consultation with a departmental advisor.
GRADUATE PROGRAMS

The faculty in the Department of Geological Sciences offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. See the Graduate Catalog for requirements.

GEOLICAL SCIENCES (GLG)

GLG 101 Introduction to Geology I (Physical). (3)
fall, spring, summer
Basic principles of geology, geochemistry, and geophysics. Rocks, minerals, weathering, earthquakes, mountain building, volcanoes, water, and glaciers. Possible weekend field trips.
General Studies: SQ (if credit also earned in GLG 103), G

GLG 102 Introduction to Geology II (Historical). (3)
spring
Basic principles of applied geology and the use of these principles in the interpretation of geologic history. Possible weekend field trips.
Fee. Prerequisite: GLG 101.
General Studies: SG (if credit also earned in GLG 104), H

GLG 103 Introduction to Geology I—Laboratory. (1)
fall, spring, summer
3 hours lab, some field trips, Fee. Corequisite: GLG 101.
General Studies: SQ (if credit also earned in GLG 101)

GLG 104 Introduction to Geology II—Laboratory. (1)
spring
Laboratory techniques involving map interpretation, cross sections, and fossils. 3 hours lab, possible field trips. Prerequisite: GLG 103 (or its equivalent). Corequisite: GLG 102.
General Studies: SG (if credit also earned in GLG 102)

GLG 105 Introduction to Planetary Science. (4)
spring
Solar system objects and their geologic evolution, surfaces, interiors, and atmospheres; weekly laboratory for data analysis and experiments; weekend field trip. Lecture, lab.
General Studies: SG

GLG 110 Environmental Geology. (3)
fall
Geological studies as they apply to interactions between humans and earth. Includes geological processes and hazards, resources, and global change.
General Studies: SG (if credit also earned in GLG 111), G

GLG 111 Environmental Geology Laboratory. (1)
fall
General Studies: SG (if credit also earned in GLG 110)

GLG 294 Special Topics. (1–4)
not regularly offered
Possible topics:
(a) Geology of the Planets
Fee.

GLG 300 Geology of Arizona. (3)
fall
Once a year
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.

GLG 304 Geology of the Grand Canyon. (2)
not regularly offered
Reviews 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.

GLG 310 Structural Geology. (3)
spring
Geologic structures and the mechanical processes involved in their formation. 2 hours lecture, 3 hours lab. Possible field trips. Fee. Prerequisites: GLG 101; MAT 270 (or 290).

GLG 321 Mineralogy. (3)
fall
Crystal chemistry, crystallography, mineral identification, origin and occurrence of minerals, systematic mineralogy. 2 hours lecture, 3 hours lab, possible field trips. Prerequisites: CHM 113; MAT 270 (or 290).

GLG 335 Paleontology. (3)
fall
Introduction to concepts and analytical techniques in biogeology, paleobiology, paleoecology, and paleoenvironmental reconstruction from the fossil record. 2 hours lecture, 3 hours lab. Fee. Prerequisites: both GLG 102 and MAT 270 (or 290) or only instructor approval.

GLG 336 Invertebrate Paleontology. (3)
not regularly offered
Biology, skeletal morphology, and systematics of fossil invertebrates. One or two projects emphasizing population analysis and techniques in paleontology. Lecture, 6 hours lab, possible field trips. Fee. Prerequisite: GLG 102 or instructor approval. Pre- or corequisite for Geological Sciences majors: GLG 335.

GLG 362 Geomorphology. (3)
not regularly offered
Landforms and processes which create and modify them. Laboratory and field study of physiographic features. 2 hours lecture, 3 hours lab, possible weekend field trips. Prerequisite: GLG 101. Pre- or corequisite: GLG 310.

GLG 400 Geology Colloquium. (1)
fall and spring
Presentation of recent research by faculty and guests. Written assignments required. 1 semester hour required for Geological Sciences majors; may be repeated for a total of 2 semester hours. Prerequisite: 2 courses in the department or instructor approval.

GLG 405 Geology of the Moon. (3)
not regularly offered
Current theories of the origin and evolution of the moon through photogeological analyses and consideration of geochemical and geophysical constraints. Possible field trips to examine Arizona geology. Fee. Prerequisite: GLG 105 or instructor approval.

GLG 406 Geology of Mars. (3)
not regularly offered
Geological evolution of Mars through analyses of spacecraft data, theoretical modeling, and study of terrestrial analogs; emphasis on current work. Possible field trips to examine Arizona geology. Fee. Prerequisite: GLG 105 or instructor approval.

GLG 410 Computers in Geology. (3)
fall
Geological computer skills including data processing, visualization, presentation, numerical analysis, software and hardware applications. 2 hours lecture, 3 hours lab. Prerequisites: both GLG 101 and one upper-division geology course or only instructor approval.

GLG 412 Geotectonics. (3)
not regularly offered
Earthquakes, earth's interior, formation of oceanic and continental crust, and plate tectonics. Emphasis on current work. Prerequisite: GLG 310.

GLG 416 Field Geophysics. (3)
spring
Methods of applied geophysical exploration; seismic refraction, gravity, electrical resistivity, geomagnetics. Includes survey planning, data acquisition, processing, analysis, and interpretation. Lecture, field exercises. Prerequisite: one course in geology or instructor approval.

GLG 418 Geophysics. (3)
fall
Solid earth geophysics: geomagnetism, gravity, seismology, heat flow. Emphasis on crust and upper mantle. Prerequisites: a combination of GLG 310 and MAT 272 and PHY 131 or only instructor approval.

GLG 419 Geodynamics. (3)
not regularly offered
Emphasis on application of continuum principles to geophysical problems, including lithospheric stresses, heat transfer, fluid mechanics, and rock rheology. Prerequisite: PHY 131.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Term(s)</th>
<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLG 420</td>
<td>Volcanology</td>
<td>3</td>
<td>once a year</td>
<td>Distribution of past and present volcanism, types of volcanic activity, mechanism of eruption, form and structure of volcanoes, and geochemistry of volcanic activity. Possible weekend field trips. Fee. Prerequisite: GLG 424.</td>
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<tr>
<td>GLG 424</td>
<td>Petrology</td>
<td>3</td>
<td>fall</td>
<td>Origin of igneous and metamorphic rocks. Optical mineralogy, hand specimen identification, and thin-section analysis. 2 hours lecture, 3 hours lab, possible weekend field trips. Fee. Prerequisite: GLG 321.</td>
<td></td>
</tr>
<tr>
<td>GLG 435</td>
<td>Sedimentology</td>
<td>3</td>
<td>spring</td>
<td>Origin, transport, deposition, and diagenesis of sediments and sedimentary rocks. Physical analysis, hand specimen examination, and interpretation of rocks and sediments. 2 hours lecture, 3 hours lab, possible weekend field trips. Fee. Prerequisites: GLG 102, 321.</td>
<td></td>
</tr>
<tr>
<td>GLG 441</td>
<td>Ore Deposits</td>
<td>3</td>
<td>not regularly offered</td>
<td>Origin, occurrence, structure, and mineralogy of ore deposits. Possible weekend field trips. Fee. Prerequisite: GLG 424 or instructor approval.</td>
<td></td>
</tr>
<tr>
<td>GLG 451</td>
<td>Field Geology I</td>
<td>3</td>
<td>spring</td>
<td>Geological mapping techniques using topographic maps and aerial photos. Intensive field-based instruction. Lab. Prerequisites: GLG 310, 321.</td>
<td></td>
</tr>
<tr>
<td>GLG 452</td>
<td>Field Geology II</td>
<td>3</td>
<td>summer</td>
<td>Continuation of GLG 451. Lab. Prerequisite: GLG 451.</td>
<td></td>
</tr>
<tr>
<td>GLG 455</td>
<td>Advanced Field Geology</td>
<td>(3–4)</td>
<td>once a year</td>
<td>Geologic mapping in igneous, sedimentary, and metamorphic terrains of the Basin and Range province of Arizona. May be repeated for credit. Weekend field trips. Fee. Prerequisite: instructor approval.</td>
<td></td>
</tr>
<tr>
<td>GLG 456</td>
<td>Cordilleran Regional Geology</td>
<td>(3)</td>
<td>not regularly offered</td>
<td>Systematic coverage through space and time of the geological development of western North America, emphasizing the western United States. Fee. Prerequisite: senior major or graduate student in Geological Sciences or instructor approval.</td>
<td></td>
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<tr>
<td>GLG 470</td>
<td>Hydrogeology</td>
<td>(3)</td>
<td>spring</td>
<td>Geology of groundwater occurrence, aquifer and well hydraulics, water chemistry and quality, contaminant transport, remediation. Emphasis on quantitative methods. Prerequisites: GLG 101 (or 103); MAT 270; PHY 121.</td>
<td></td>
</tr>
<tr>
<td>GLG 481</td>
<td>Geochemistry</td>
<td>(3)</td>
<td>spring</td>
<td>Origin and distribution of the chemical elements. Geochemical cycles operating in the earth's atmosphere, hydrosphere, and lithosphere. Cross-listed as CHM 481. Credit is allowed for only CHM 481 or GLG 481. Prerequisite: CHM 341 (or 346) or GLG 321.</td>
<td></td>
</tr>
<tr>
<td>GLG 484</td>
<td>Geology Internship</td>
<td>(3)</td>
<td>fall and spring</td>
<td>Assist in teaching fifth-grade students a simplified version of GLG 103 using hands-on activities.</td>
<td></td>
</tr>
<tr>
<td>GLG 485</td>
<td>Meteorites and Cosmochemistry</td>
<td>(3)</td>
<td>not regularly offered</td>
<td>Chemistry of meteorites and their relationship to the origin of the earth, solar system, and universe. Cross-listed as CHM 485. Credit is allowed for only CHM 485 or GLG 485.</td>
<td></td>
</tr>
<tr>
<td>GLG 490</td>
<td>Topics in Geology</td>
<td>(1–3)</td>
<td>fall, spring, summer</td>
<td>Special topics in a range of fields in geology. May be repeated for credit. Fee. Prerequisite: instructor approval.</td>
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</tr>
<tr>
<td>GLG 495</td>
<td>Undergraduate Thesis</td>
<td>(3)</td>
<td>fall, spring, summer</td>
<td>Guided research culminating in the completion and presentation of an undergraduate thesis based on supervised research. Independent study. Prerequisite: GLG 499 (3 hours): formal conference with instructor; instructor and department chair approval.</td>
<td></td>
</tr>
<tr>
<td>GLG 499</td>
<td>Individualized Instruction</td>
<td>(1–3)</td>
<td>not regularly offered</td>
<td>Study a specific area of interest not listed in the department offerings. May be repeated for credit. Fee. Prerequisite: instructor approval.</td>
<td></td>
</tr>
<tr>
<td>GLG 500</td>
<td>Geology Colloquium</td>
<td>(1)</td>
<td>fall and spring</td>
<td>Presentation of recent research by faculty and invited guests. 1 semester required for all Geological Sciences graduate students. May be repeated for a total of 2 semesters. Research paper required. Prerequisite: instructor approval.</td>
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<tr>
<td>GLG 501</td>
<td>Geology of Arizona</td>
<td>(3)</td>
<td>once a year</td>
<td>Basic and historical geology, fossils, mining, energy resources, environmental problems, landscape development, and meteorites, cast in examples from Arizona. Research paper required.</td>
<td></td>
</tr>
<tr>
<td>GLG 504</td>
<td>Geology of the Grand Canyon</td>
<td>(2)</td>
<td>not regularly offered</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>GLG 510</td>
<td>Advanced Structural Geology</td>
<td>(3)</td>
<td>not regularly offered</td>
<td>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. Fee. Prerequisites: both GLG 310 and 424 or only instructor approval.</td>
<td></td>
</tr>
</tbody>
</table>
GLG 520 Advanced Physical Volcanology. (2–3)
not regularly offered
Selected volcanologic topics, including explosive eruption processes, lava flow mechanics, and intrusive mechanisms. Possible field trips. Fee. Prerequisite: GLG 420 or instructor approval.

GLG 524 Advanced Igneous Petrology. (3)
not regularly offered
Theoretical and practical aspects of the genesis of igneous rocks. Study of selected sites. Modern laboratory techniques. 2 hours lecture, 3 hours lab, possible weekend field trips. Fee. Prerequisite: GLG 424.

GLG 581 Isotope Geochemistry. (3)
not regularly offered
Geochemistry and cosmochemistry of stable and radioactive isotopes; geochronology; isotope equilibria. Prerequisite: instructor approval.

GLG 582 Physical Geochemistry. (3)
not regularly offered
Applications of thermodynamic and kinetic principles to geochemical processes. Prerequisite: CHM 341 (or 346) or GLG 321.

GLG 583 Phase Equilibria and Geochemical Systems. (3)
not regularly offered
Natural reactions at high temperatures and pressures; silicate, sulfide, and oxide equilibria. Cross-listed as CHM 583. Credit is allowed for only CHM 583 or GLG 583. Prerequisite: instructor approval.

GLG 591 Seminar. (1–3)
fall, spring, summer
Topics in a range of fields in geology. May be repeated for credit. Fee. Prerequisite: instructor approval.

GLG 592 Research. (1–12)
fall, spring, summer

GLG 598 Special Topics. (1–4)
fall, spring, summer
Special topics in geological sciences. May be repeated for credit. Possible topics:
(a) Advanced Field Geology. (1–3) Fee.
(b) Clastic Sedimentology and Petrology. (1–3) Fee.
(c) Cordilleran Regional Geology. (1–3) Fee.
(d) Fundamental Planetary Geology. (1–3) Fee.
(e) Geology of Mars. (1–3) Fee.
(f) Methods in Geoscience Teaching. (1–3) Fee.
(g) Ore Deposits. (1–3) Fee.
(h) Orogenic Systems. (1–3) Fee.
(i) Petrology-Petrography. (1–3) Fee.
(j) Principles of Stratigraphy. (1–3) Fee.
(l) Sedimentology. (1–3) Fee.
(m) Volcanology. (1–3) Fee.
Prerequisite: instructor approval.

GLG 599 Thesis. (1–12)
fall, spring, summer

GLG 792 Research. (1–12)
fall, spring, summer

GLG 799 Dissertation. (1–15)
fall, spring, summer

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
4. HST 498, three hours (may be within a concentration);
5. elective related field courses, six hours;
6. two HST courses with content outside Europe and the United States (may be within a concentration);
7. two HST courses in thematic concentration outside the geographic concentration; and
8. at least one course in the HST 302–306 “Studies in History” sequence as part of one concentration.

A minimum GPA of 2.25 in the 30 hours of history course work is required.

**Asian Studies Certificate.** Students majoring in History may elect to pursue an Asian Studies Certificate combining courses from the major with selected outside courses of wholly Asian content. See “Asian Studies,” page 324, for more information.

**Jewish Studies Certificate.** Students majoring in History may elect to pursue the Jewish Studies Certificate combining courses from the major with selected outside courses of wholly Jewish content. See “Jewish Studies,” page 326, for more information.

**Latin American Studies Certificate.** Students majoring in History may elect to pursue a Latin American Studies Certificate combining courses from the major with selected outside courses of wholly Latin American content. See “Latin American Studies,” page 326, for more information.

**Medieval and Renaissance Studies Certificate.** Students majoring in History may elect to pursue the Medieval and Renaissance Studies Certificate by successfully completing the requirements. See “Medieval and Renaissance Studies,” page 326, for more information.

**Russian and East European Studies Certificate.** Students majoring in History may elect to pursue the Russian and East European Studies Certificate combining courses from the major with selected outside courses of wholly Russian and East European content. See “Russian and East European Studies,” page 326, for more information.

**Southeast Asian Studies Certificate.** Students majoring in History may elect to pursue the Southeast Asian Studies Certificate combining courses from the major with selected outside courses of wholly Southeast Asian content. See “Southeast Asian Studies,” page 327, for more information.

**Women’s Studies Certificate.** Students majoring in History may elect to pursue a Women’s Studies Certificate by successfully completing the requirements. See “Women’s Studies,” page 327, for more information.

**MINOR IN HISTORY**

The History minor consists of 18 semester hours of course work, at least 12 hours of which are in upper-division course work. Students earning a minor in history must complete one 12 hour HST concentration (geographic or thematic), HST 300, and 498. The Department of History requires a grade of at least “C” in all courses in the minor. A minimum of six upper-division hours in the minor must be taken in residence at ASU Main.

**SECONEDARY EDUCATION—B.A.E.**

**History.** The major teaching field consists of 42 semester hours, of which at least 30 must be in history courses. At least 18 must be in upper-division courses. At least 15 must be in U.S. history. The remaining history and related-area courses must be selected in consultation with an advisor from the Department of History. All degree candidates must complete the following four-course methods block:

HST 300 Historical Inquiry L/\(SB, H\) ..............................................3
HST 480 Methods of Teaching History: Classroom Resources \(....3\)
HST 481 Methods of Teaching History: Community Resources .............................................3
HST 498 PS: History Pro-Seminar \(L\) ..............................................3

Students should complete HST 300 before enrolling in HST 480, 481, and 498. A minimum GPA of 2.50 in history courses is required for admission to student teaching and for graduation. HST 480 and 481 may not be counted as part of the 42-hour requirement for the academic specialization.

**GRADUATE PROGRAMS**

The faculty in the Department of History offer programs leading to the M.A. and Ph.D. degrees. A Scholarly Publishing Certificate is also available. See the *Graduate Catalog* for requirements.

**HISTORY (HST)**

HST 101 Global History Since 1500. (3)  
fall and spring
Survey of Africa, the Americas, and Eurasia; changes in communication, communities, demography, economics, environment, politics, religion, technology, warfare, and women. Lecture, CD-ROM, electronic forum, discussion.
General Studies: G, H

HST 102 Western Civilization. (3)  
fall and spring
Origins and development of Western societies and institutions from the ancient world through the Middle Ages.
General Studies: SB, H

HST 103 Western Civilization. (3)  
fall and spring
Origins and development of Western societies and institutions from Black Death through the Renaissance and Reformation to the Enlightenment.
General Studies: SB, H

HST 104 Western Civilization. (3)  
fall and spring
Origins and development of Western societies and institutions from the French Revolution to the present.
General Studies: SB, G, H

HST 105 Slavic Civilization. (3)  
fall, spring, summer
Development of Slavic cultures and societies from medieval Byzantium to the present; introduction to modern Eurasia. Lecture, discussion, electronic forum.
General Studies: SB, H

HST 106 Asian Civilizations. (3)  
once a year
Civilizations of China, Japan, and India from antiquity to the 17th century.
General Studies: SB, G, H

HST 107 Asian Civilizations. (3)  
once a year
Civilizations of China, Japan, India, and Southeast Asia from the 17th century to the present.
General Studies: SB, G, H
HST 108 Introduction to Japan. (3)  
Fall  
Historical survey of the people, culture, politics, and economy of Japan, supplemented by audiovisual presentations. Intended for non-majors.  
General Studies: SB, G, H  
HST 109 The United States to 1865. (3)  
Fall and Spring  
Growth of the Republic from the colonial period through the Civil War.  
General Studies: SB, H  
HST 110 The United States Since 1865. (3)  
Fall and Spring  
Growth of the Republic from the Civil War to the present.  
General Studies: SB, H  
HST 200 Historical Themes. (3)  
Once a year  
General introduction to selected themes in history. May be repeated for credit when topics vary.  
General Studies: SB, H  
HST 201 Historical Themes in Asia. (3)  
Once a year  
General introduction to selected themes in Asian history. May be repeated for credit when topics vary.  
General Studies: SB, H  
HST 202 Historical Themes in Europe. (3)  
Once a year  
General introduction to selected themes in European history. May be repeated for credit when topics vary.  
General Studies: SB, H  
HST 203 Historical Themes in Latin America. (3)  
Once a year  
General introduction to selected themes in Latin American history. May be repeated for credit when topics vary.  
General Studies: SB, H  
HST 204 Historical Themes in the United States. (3)  
Once a year  
General introduction to selected themes in United States history. May be repeated for credit when topics vary.  
General Studies: SB, H  
HST 210 American Social History. (3)  
Once a year  
American society from the colonial period to the present. Ethnicity, race, age, and sex as factors in historical experience. Prerequisite:  
ENG 101 (or 105).  
General Studies: L, H  
HST 211 American Jewish History. (3)  
Not regularly offered  
Chronological analysis of Jews and Judaism in American history and letters.  
General Studies: SB, H  
HST 212 American Military History. (3)  
Not regularly offered  
Study of the role of the military in American life during war and peace from colonial times to the present day. 3 hours lecture, conference.  
General Studies: SB, H  
HST 240 Introduction to Southeast Asia. (3)  
Fall  
Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/GCU 240/POS 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.  
General Studies: G  
HST 294 ST: Selected Topics in History. (3)  
Not regularly offered  
Full description of topics for any semester is available in the Department of History office. May be repeated for credit.  
HST 300 Historical Inquiry. (3)  
Fall and Spring  
Historical methods and critical inquiry related to particular events and processes. Topics vary. Required course for majors. Prerequisite for HST 498. Discussion, seminar, lecture. Prerequisites: ENG 102; History major.  
General Studies: L/SB, H  
HST 302 Studies in History. (3)  
Once a year  
Specialized topics in history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.  
General Studies: SB, H  
HST 303 Studies in Asian History. (3)  
Once a year  
Specialized topics in Asian history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.  
General Studies: SB, H  
HST 304 Studies in European History. (3)  
Once a year  
Specialized topics in European history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.  
General Studies: SB, H  
HST 305 Studies in Latin American History. (3)  
Once a year  
Specialized topics in Latin American history. Explores countries, cultures, and issues in history, and their interpretation in historical scholarship.  
General Studies: SB, H  
HST 306 Studies in United States History. (3)  
Once a year  
Specialized topics in United States history. Explores regions, cultures, and issues in history, and their interpretation in historical scholarship.  
General Studies: SB, H  
HST 309 Exploration and Empire. (3)  
Once a year  
Survey of European discovery, exploration, and imperialism in the early modern and modern periods.  
General Studies: L, H  
HST 310 Film as History. (3)  
Once a year  
Survey of moving image media as recorder, object, and writer of history.  
General Studies: HU  
HST 313 American Cultural History to 1865. (3)  
Fall and Spring  
Culture, including ideas, ideals, the arts, and social and economic standards, from the nation’s colonial and early national periods.  
General Studies: SB, H  
HST 314 American Cultural History Since 1865. (3)  
Fall and Spring  
Culture, including ideas, ideals, the arts, and social and economic standards, from the age of industrialism and modern U.S.  
General Studies: SB, H  
HST 315 Political History of the United States. (3)  
Once a year  
American political history since independence, focusing post-1865. Evaluates major trends in issues, presidential leadership, elections, and state politics. Lecture, discussion.  
General Studies: SB, H  
HST 316 20th-Century U.S. Foreign Relations. (3)  
Once a year  
U.S. relations with foreign powers from the late 19th century to the present.  
General Studies: SB, G, H  
HST 318 United States Labor History. (3)  
Not regularly offered  
American workers, from the colonial period to the present, including farmers, slaves, housewives, the skilled and unskilled, unionized and nonunionized.  
General Studies: SB, H

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
HST 319 U.S. Urban History to 1850. (3)
once a year
History of the city in American life from the colonial period to the mid-19th century.
General Studies: SB, H

HST 320 U.S. Urban History Since 1850. (3)
once a year
History of the city in American life from the mid-19th century to the present.
General Studies: SB, H

HST 321 Constitutional History of the United States to 1865. (3)
fall
Origin and development of the American constitutional system from colonial period through the Civil War.
General Studies: SB, H

HST 322 Constitutional History of the United States Since 1865. (3)
spring
Development of the U.S. constitutional system from Reconstruction to the present.
General Studies: SB, H

HST 325 Immigration and Ethnicity in the United States. (3)
fall and spring
Origins, historical development, and future of a multiethnic society, 1492 to 2050. Prerequisite: HST 109 or 110.
General Studies: SB, C, H

HST 327 Women in U.S. History, 1600–1880. (3)
fall and spring
Examines American women of diverse racial, religious, and ethnic groups, and classes; focuses on changing definitions of women’s roles.
General Studies: SB, C, H

HST 328 Women in U.S. History, 1880–1980. (3)
fall and spring
Examines American women of diverse racial, religious, and ethnic groups, and classes; focuses on changing definitions of women’s roles.
General Studies: SB, C, H

HST 329 Women in 20th-Century U.S. West. (3)
once a year
Examines how women of various cultures have contended for and shaped the U.S. West, including the West of imagination. Lecture, discussion.
General Studies: C, H

HST 330 Mexican Women in the United States: Conquests and Migrations. (3)
once a year
Overview of Chicana history from Mesoamerican origins to the present, focusing on Mexican women in the western U.S. Lecture, discussion.
General Studies: L/SB, C, H

HST 331 Mexican American History to 1900. (3)
once a year
Mexican American history from pre-Hispanic origins to frontier journeys north through 19th-century life in the U.S. Southwest.
General Studies: SB, H

HST 332 Mexican American History Since 1900. (3)
once a year
Traces the formation of Mexican American communities across the rural and urban U.S. and examines 20th-century immigration from Mexico.
General Studies: SB, C, H

HST 333 African American History to 1865. (3)
once a year
The African American in American history, thought, and culture from slavery to 1865. Cross-listed as AFS 363. Credit is allowed for only AFS 363 or HST 333.
General Studies: SB, C, H

HST 334 African American History Since 1865. (3)
once a year
The African American in American history, thought, and culture from 1865 to the present. Cross-listed as AFS 364. Credit is allowed for only AFS 364 or HST 334.
General Studies: SB, C, H

HST 337 American Indian History to 1900. (3)
fall and spring
Cultural, economic, political, and social continuity and change of American Indian communities to 1900.
General Studies: SB, C, H

HST 338 American Indian History Since 1900. (3)
fall and spring
Cultural, economic, political, and social continuity and change of American Indian communities from 1900 to the present.
General Studies: SB, C, H

HST 341 The U.S. West in the 19th Century. (3)
once a year
Social, political, and economic development of the trans-Mississippi West, beginning with the Louisiana Purchase and ending in 1900.
General Studies: SB, H

HST 342 The U.S. West in the 20th Century. (3)
fall and spring
Role of the western states in U.S. history since 1890 emphasizing politics, the environment, industry and labor, and ethnic minorities.
General Studies: SB, H

HST 343 The American Southwest. (3)
once a year
Development of the region from 1848 to the present.
General Studies: L/SB, H

HST 344 Arizona. (3)
fall and spring
Emergence of the state from early times to the present.
General Studies: SB, H

HST 347 Ancient Greece. (3)
fall
History and civilization of the Greek world from 650 B.C.E. to the death of Alexander the Great.
General Studies: SB, H

HST 348 Rome. (3)
spring
History and civilization of Rome from the beginning of the Republic to the end of the Empire.
General Studies: SB, H

HST 349 The Early Middle Ages. (3)
fall
Political, socioeconomic, and cultural developments of Western Europe from the 5th through 10th centuries.
General Studies: SB, H

HST 350 The Later Middle Ages. (3)
spring
Political, socioeconomic, and cultural developments of Western Europe from the 11th through 15th centuries.
General Studies: SB, H

HST 351 Renaissance Europe. (3)
fall
Culture of the Renaissance in Italy and Northern Europe from the 14th to the early 16th centuries.
General Studies: L/SB, H

HST 352 Europe’s Reformations. (3)
spring
Causes and implications of the major Protestant, Catholic, and Radical religious reformations in 16th- and 17th-century Europe.
General Studies: L/SB, H

HST 353 The Old Regime in Europe. (3)
fall
Society and culture of Europe during the 17th and 18th centuries.
General Studies: SB, H

HST 354 Revolutionary Europe. (3)
spring
Political, social, economic, and intellectual currents in Europe from the French through the Russian Revolutions.
General Studies: SB, H

HST 355 Total War and the Crisis of Modernity. (3)
fall
Forces of change and instability in early 20th-century Europe.
General Studies: SB, G, H
HST 356 Europe Since 1945. (3)
not regularly offered
Europe in its world setting since World War II, emphasizing major political and social issues from 1945 to the present.
General Studies: SB, G, H

HST 358 Jewish History from the Bible to 1492. (3)
fall
Continuity and change in political, legal, economic, and sociocultural history of the Jews from biblical through medieval times. Lecture, discussion.

HST 359 Jewish History from 1492 to 1948. (3)
spring
Jewish history from early modern through modern times, highlighting emancipation, enlightenment, and Jewish responses to modernity. Lecture, discussion.

HST 361 Witchcraft and Heresy in Europe. (3)
not regularly offered
Background, origins, and development of the Inquisition; persecution of women and marginal groups. Cross-listed as REL 374. Credit is allowed for only HST 361 or REL 374. Prerequisite: upper-division standing or instructor approval.
General Studies: L, H

HST 362 Sex and Society in Classical and Medieval Europe. (3)
fall
Family life, sex roles, and marriage, and their relationship to political, economic, and religious change in classical and medieval Europe. Lecture, discussion. Prerequisite: upper-division standing or instructor approval.
General Studies: SB, H

HST 363 Sex and Society in Early Modern Europe. (3)
spring
Family life, sex roles, and marriage and their relationship to political, economic, and religious change in early modern Europe. Lecture, discussion. Prerequisite: upper-division standing or instructor approval.
General Studies: SB, H

HST 364 Sex and Society in Modern Europe. (3)
not regularly offered
Family life, sex roles, and marriage, and their relationship to political, economic, and social changes in modern Europe. Lecture, discussion. Prerequisite: upper-division standing or instructor approval.
General Studies: L/SB, H

HST 365 Women in Europe. (3)
once a year
European women's diverse religious, ethnic, national, and economic roles in society, culture, and politics, 1750 to the present.
General Studies: L/HU/SB, H

HST 366 England to 1689. (3)
once a year
Political, economic, and social development of the English people to the late 17th century.
General Studies: SB, H

HST 367 Modern Britain. (3)
once a year
Political, economic, and social development in Britain from 17th century to the present.
General Studies: SB, H

HST 368 Culture and Imagination in European History. (3)
once a year
Topics in European cultural and intellectual history. May be repeated for credit.
General Studies: HU, H

HST 370 Eastern Europe in Transition. (3)
once a year
Democratization, privatization, and identity transformations since the fall of communism in contemporary Eastern Europe and the former Soviet Union. Lecture, discussion.
General Studies: SB, G, H

HST 372 The Modern Middle East. (3)
not regularly offered
Impact of the West and modernization upon Middle Eastern governments, religion, and society in the 19th and 20th centuries.
General Studies: SB, G, H

HST 374 ST: Selected Topics in History. (3)
tail and spring
Full description of topics for any semester is available in the Department of History Office. May be repeated for credit.

HST 375 Colonial Latin America. (3)
tail and spring
Ancient civilization, exploration and conquerors, and colonial institutions.
General Studies: SB, H

HST 376 Modern Latin America. (3)
tail and spring
Nationalistic development of the independent republics since 1821.
General Studies: SB, H

HST 377 Women in Colonial Latin America. (3)
tail
History of women in colonial Latin America, cross-examining class, race, and gender relations in depth. Lecture, discussion.
General Studies: H

HST 378 Latin American Women: The National Period. (3)
spring
Surveys the history of women, gender relations, and state policies in a broad continental setting, from independence to the present. Lecture, media, discussion.
General Studies: SB, G, H

HST 380 Cultural History of Latin America. (3)
not regularly offered
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.
General Studies: SB, H

HST 383 China. (3)
tail
Political, economic, social, and cultural history of the Chinese people from early times to the 17th century.
General Studies: SB, H

HST 384 China. (3)
spring
Political, economic, social, and cultural history of the Chinese people from the 17th century to the present.
General Studies: SB, G, H

HST 385 Chinese Science and Medicine. (3)
not regularly offered
Explores developments of Chinese traditions dealing with the natural world, science, and medicine. Lecture, discussion. Cross-listed as HPS 325. Credit is allowed for only HPS 325 or HST 385.
General Studies: HU, G, H

HST 386 Interpreting China's Classics. (3)
not regularly offered
Study of selected Confucian and/or Taoist classics and ways they have been read in both Asian and Western scholarship. Cross-listed as HUM 312. Credit is allowed for only HST 386 or HUM 312.
General Studies: L/HU, H

HST 387 Japan. (3)
once a year
Political, economic, social, and cultural history of the Japanese people from early times to the 17th century.
General Studies: L/SB, H

HST 388 Japan. (3)
once a year
Political, economic, social, and cultural history of the Japanese people from the 17th century to the present.
General Studies: SB, G, H

HST 390 Japanese Society and Values: Premodern. (3)
not regularly offered
Effects of economic and social transitions on personal and social values as reflected in the dramatizations of contemporary events.

HST 391 Modern Southeast Asia. (3)
spring
Vietnam, Laos, Cambodia, Thailand, Burma, Malaysia, Singapore, Brunei, Indonesia, and Philippines since 1750: imperialism, revolution, and independence. Lecture, discussion.
General Studies: SB, G, H

HST 394 ST: Selected Topics in History. (3)
tail and spring
Full description of topics for any semester is available in the Department of History Office. May be repeated for credit.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
HST 405 Colonial American History to 1763. (3)  
once a year  
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.  
General Studies: SB, H  

HST 406 The American Revolution, 1763–1789. (3)  
once a year  
Causes, course, and consequences of the American Revolution culmi-  
nating in the ratification of the Constitution.  

HST 407 The Early U.S. Republic, 1789–1850. (3)  
once a year  
Political, social, economic, and cultural development of the United  
States from the Revolution to 1850.  
General Studies: L/SB, H  

HST 408 Civil War and Reconstruction. (3)  
once a year  
Explores the causes, conduct, and consequences of the American  
Civil War, concentrating on the years 1848 to 1877.  
General Studies: L/SB, H  

HST 409 The Emergence of the Modern United States, 1877 to  
1918. (3)  
once a year  
Triumph of modern political, social, and economic structures and values,  
1877–1918; role of region, religion, race, and ethnicity.  
General Studies: SB, H  

HST 410 The Modern United States, 1918 to 1945. (3)  
once a year  
1920’s boom and the crash, the Depression and the New Deal  
response. The Second World War at home and abroad.  
General Studies: SB, H  

HST 411 The Postwar United States, 1945 to 1973. (3)  
once a year  
Cold War, prosperity, reform, and immense social and political change in  
the U.S.  
General Studies: SB, H  

HST 412 The Contemporary United States, 1973 to the Present.  
(3)  
once a year  
End of the Cold War, political crises, and cultural transformations in  
the U.S.  
General Studies: SB, H  

HST 413 The Modern U.S. Economy. (3)  
not regularly offered  
Origins of 19th-century slavery and industrialization; 20th-century cri-  
sis and regulation: political economy of an advanced capitalist democracy.  
Prerequisite: ECN 111 (or 112) or HST 109 (or 110).  
General Studies: SB, H  

HST 414 Unequal Sisters: Women and Political and Cultural  
Change. (3)  
once a year  
Examines race, ethnic, and class differences among women, focusing on  
the political and cultural experiences of women in the U.S.  
General Studies: L/SB, C, H  

HST 415 Indian History of the Southwest. (3)  
once a year  
Reviews historical events from prehistoric peoples, the Spanish and  
Mexican periods, and the U.S. period from 1846 to present.  
General Studies: SB, C, H  

HST 416 Topics in Mexican American History. (3)  
once a year  
Focuses on specific topics in Mexican American history including  
immigration, civil rights, the Chicano Movement, union activism, and  
regional and generational differences.  
General Studies: SB, C, H  

HST 417 The Tudor Monarchy. (3)  
once a year  
Political, cultural, and social foundations of 16th-century England.  
General Studies: SB, H  

HST 418 The Stuart Transformation of England. (3)  
once a year  
Political, social, economic, and cultural developments in 17th-century  
England.  
General Studies: SB, H  

HST 419 Modern Germany. (3)  
once a year  
Germany since 1871.  
General Studies: SB, G, H  

HST 420 Hitler: Man and Legend. (3)  
once a year  
Biographical approach to the German Third Reich emphasizing nature  
of Nazi regime, sociocultural issues, World War II, and historiography.  
General Studies: SB, H  

HST 421 Eastern Europe and the Balkans Before 1914. (3)  
not regularly offered  
Empire and nation in Eastern Europe and the Balkans before World  
War I, emphasizing Hapsburg and Ottoman lands.  
General Studies: SB, H  

HST 422 The British Empire. (3)  
once a year  
British imperialism and colonialism in Africa, the Americas, Asia, and  
the South Pacific. Prerequisite: upper-division standing or instructor  
approval.  
General Studies: SB, H  

HST 423 Modern France. (3)  
not regularly offered  
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.  
General Studies: SB, G, H  

HST 424 Spanish South America. (3)  
not regularly offered  
Cultural, economic, political, and social development of Spain from  
antequity to the late 17th century.  
General Studies: SB, G, H  

HST 425 The Soviet Experiment. (3)  
spring  
Communist revolutionaries’ rule of Russia, focusing on utopian cul-  
ture, Stalinist terror, heroism in war, and the breakup of the U.S.S.R.  
General Studies: SB, G, H  

HST 426 The French Revolution and the Napoleonic Era. (3)  
once a year  
Conditions in Pre-Revolutionary and Revolutionary France; organiz-  
ation of France under Napoleon and impact of French changes upon  
Europe.  
General Studies: SB, H  

HST 427 Modern Spain. (3)  
not regularly offered  
Cultural, economic, political, and social development of modern Spain.  
General Studies: SB, H  

HST 428 Modern France. (3)  
not regularly offered  
Political, economic, and social development of the Spanish-speaking  
nations of South America since independence. 19th-century develop-  
ments.  
General Studies: SB, H  

HST 429 Modern Germany. (3)  
once a year  
Germany since 1871.  
General Studies: SB, G, H  

HST 430 Hitler: Man and Legend. (3)  
once a year  
Biographical approach to the German Third Reich emphasizing nature  
of Nazi regime, sociocultural issues, World War II, and historiography.  
General Studies: SB, H  

HST 431 Eastern Europe and the Balkans Before 1914. (3)  
not regularly offered  
Empire and nation in Eastern Europe and the Balkans before World  
War I, emphasizing Hapsburg and Ottoman lands.  
General Studies: SB, H  

HST 432 Eastern Europe and the Balkans in the 20th Century. (3)  
not regularly offered  
Politics and culture in Eastern Europe and the Balkans from World  
War I to the present.  
General Studies: SB, G, H  

HST 433 The Russian Empire. (3)  
fall  
Development of Russian imperial institutions and civil society from the  
17th to the early 20th centuries. Lecture, discussion.  
General Studies: SB, H  

HST 434 The Soviet Experiment. (3)  
spring  
Communist revolutionaries’ rule of Russia, focusing on utopian cul-  
ture, Stalinist terror, heroism in war, and the breakup of the U.S.S.R.  
General Studies: SB, G, H  

HST 435 The Russian Empire. (3)  
fall  
Development of Russian imperial institutions and civil society from the  
17th to the early 20th centuries. Lecture, discussion.  
General Studies: SB, H  

HST 436 The Soviet Experiment. (3)  
spring  
Communist revolutionaries’ rule of Russia, focusing on utopian cul-  
ture, Stalinist terror, heroism in war, and the breakup of the U.S.S.R.  
General Studies: SB, G, H  

HST 437 The Russian Empire. (3)  
fall  
Development of Russian imperial institutions and civil society from the  
17th to the early 20th centuries. Lecture, discussion.  
General Studies: SB, H  

HST 438 Modern Spain. (3)  
not regularly offered  
Cultural, economic, political, and social development of modern Spain.  
General Studies: SB, H  

HST 439 Modern France. (3)  
not regularly offered  
Political, economic, and social development of the Spanish-speaking  
nations of South America since independence. 19th-century develop-  
ments.  
General Studies: SB, H  

HST 440 Modern Spain. (3)  
not regularly offered  
Cultural, economic, political, and social development of modern Spain.  
General Studies: SB, H  

HST 441 Spanish South America. (3)  
not regularly offered  
Political, economic, and social development of the Spanish-speaking  
nations of South America since independence. 19th-century develop-  
ments.  
General Studies: SB, H  

HST 442 Spanish South America. (3)  
not regularly offered  
Cultural, economic, political, and social development of the Spanish-speaking  
nations of South America since independence. 19th-century develop-  
ments.  
General Studies: SB, H  

HST 443 The United States and Latin America. (3)  
once a year  
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.  
General Studies: SB, G, H
HST 445 20th-Century Cuba. (3)
- once a year
- History of Cuba from colonial era to formation of the early republic; political, economic, social development in late 20th century. Lecture, discussion.
- General Studies: SB, G, H

HST 446 Colonial Mexico. (3)
- once a year
- Political, economic, social, and cultural developments from pre-Columbian times to 1810.
- General Studies: SB, H

HST 447 Modern Mexico. (3)
- once a year
- Political, economic, social, and cultural developments from 1810 to the present.
- General Studies: SB, H

HST 451 Chinese Cultural History. (3)
- not regularly offered
- China's classics in translation studied both for their intrinsic ideas and for the origins of Chinese thought.
- General Studies: SB, G, H

HST 452 Chinese Cultural History. (3)
- not regularly offered
- Evolution of Confucian thought, its synthesis with Taoism and Buddhism, and modern reactions against, and uses of, Confucian traditions.
- General Studies: SB, G, H

HST 453 The People's Republic of China. (3)
- not regularly offered
- Analysis of major political, social, economic, and intellectual trends in China since the founding of the People's Republic in 1949.
- General Studies: SB, G, H

HST 455 The United States and Japan. (3)
- fall
- Cultural, political, and economic relations in the 19th and 20th centuries. Emphasis on post-World War II period.
- General Studies: SB, G, H

HST 456 The Vietnam War. (3)
- once a year
- Intersection of American and Asian histories in Vietnam, viewed from as many sides as possible.
- General Studies: SB, G, H

HST 460 History of Fire. (3)
- fall
- Global survey of the natural and cultural history of fire. Lecture, discussion.
- General Studies: L, H

HST 480 Methods of Teaching History: Classroom Resources. (3)
- fall
- Methods in instruction, organization, and presentation of the subject matter of history and closely allied fields. Prerequisites: HST 300; admission to PTPP.

HST 481 Methods of Teaching History: Community Resources. (3)
- spring
- Identifying community-based resources for teaching history, work with resources, and learn how to integrate them into the secondary classroom. Lecture, lab. Prerequisites: HST 300; admission to PTPP.

HST 484 Internship. (1–4)
- not regularly offered

HST 492 Honors Directed Study. (1–6)
- not regularly offered

HST 493 Honors Thesis. (3)
- not regularly offered
- General Studies: L

HST 494 Special Topics. (1–4)
- not regularly offered

HST 498 PS: History Pro-Seminar. (3)
- fall and spring
- Required course for majors on topic selected by instructor; writing-intensive course related to the development of research skills and writing tools used by historians. Prerequisites: HST 300; History major.
- General Studies: L

HST 499 Individualized Instruction. (1–3)
- not regularly offered

HST 500 Methods of Historical Investigations. (1–12)
- not regularly offered

HST 502 Public History Methodology. (3)
- fall
- Introduction to historical research methodologies, techniques, and strategies used by public historians. Readings, short papers, and guest speakers. Required for students in the public history concentration.

HST 512 Western Civilization to the Enlightenment. (3)
- fall
- Systematically examines various interpretations of Western civilization from the ancient Middle Eastern civilizations to the European Enlightenment. Seminar.

HST 513 Western Civilization Since the French Revolution. (3)
- spring
- Systematically examines various interpretations of Western civilization since the French Revolution. Seminar.

HST 514 Historians of the United States. (3)
- not regularly offered
- Study of the history of American historical writing from the early colonial days to the 20th century.

HST 515 Studies in Historiography. (3)
- fall and spring
- Methods and theories of writers of history. May be repeated for credit.

HST 525 Historical Resource Management. (3)
- fall
- Identification, documentation, and interpretation of historic period buildings, sites, and districts. Emphasis on interdisciplinar y efforts among historians, architects, and anthropologists.

HST 526 Historians and Preservation. (3)
- spring
- Preparation of historians for public and private historic preservation programs. Prerequisite: HST 525 or instructor approval.

HST 527 Historical Administration. (3)
- fall
- Preparation of historians in administration of archives, historical sites, historical museums, historical societies, and historical offices in government agencies.

HST 532 Community History. (3)
- not regularly offered
- Techniques and methods of community history emphasizing local resources. Required for community history option. Seminar.

HST 551 Comparative Histories of War and Revolution. (3)
- once a year
- Comparative field course of the themes of war and revolution.

HST 552 Comparative History of Family and Community. (3)
- not regularly offered
- Comparative course with a focus on family, including minority and ethnic groups, in society.

HST 553 Comparative History of State and Institutions. (3)
- not regularly offered
- Comparative course that explores the changing nature of central institutions and government.

HST 554 Comparative Historical Population Studies: Ethnicity, Economy, and Migration. (3)
- not regularly offered
- Comparative course that explores the impact of social, cultural, or economic changes in the population.

HST 555 Comparative Historical Topics. (3)
- not regularly offered
- Analyzes a variety of specific social, political, cultural, and intellectual topics.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
The humanities include archaeology, comparative religion, ethics, history, jurisprudence, literature, linguistics, philosophy, the history and criticism of the arts, and those aspects of the social sciences that employ a philosophical or historical rather than quantitative approach to knowledge.

**HUMANITIES—B.A.**

The major in Humanities is interdisciplinary and may be intercollegiate. In consultation with an advisor, the student takes a minimum of 44 semester hours of interdisciplinary humanities courses from two components: (1) an interdisciplinary core of 23 hours and (2) an area of concentration of 21 hours.

<table>
<thead>
<tr>
<th>Interdisciplinary Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issues, Methods, and Theory</td>
</tr>
<tr>
<td>HUM 200 Encountering the Humanities HU .......................... 3</td>
</tr>
<tr>
<td>HUM 498 Pre-Seminar in the Humanities L/HU ....................... 3</td>
</tr>
<tr>
<td>Cultures in Context</td>
</tr>
<tr>
<td>HUM 301 Humanities in the Western World L/HU, H ............... 4</td>
</tr>
<tr>
<td>HUM 302 Humanities in the Western World L/HU, H ............... 4</td>
</tr>
<tr>
<td>One approved upper-division HUM course on the cultures and traditions of Latin America, Asia, or Africa ................... 3</td>
</tr>
<tr>
<td>Ethnicity, Race, and Gender</td>
</tr>
<tr>
<td>One approved course ....................................................... 3</td>
</tr>
<tr>
<td>Art, Science, and Technology</td>
</tr>
<tr>
<td>One approved course ....................................................... 3</td>
</tr>
<tr>
<td>Total ................................................................. 23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area of Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required courses from list obtained from advisor ................ 21</td>
</tr>
</tbody>
</table>

Courses must be selected from an approved list or be approved in advance by the undergraduate advisor. Areas of study include architecture, culture, and society; classical studies; film studies; humanities; humanities and sciences; and liberal arts.

**MINOR IN HUMANITIES**

The following courses are required for the minor:

| HUM 110 Contemporary Issues in the Humanities HU ............. 3 |
| HUM 301 Humanities in the Western World L/HU, H ............... 4 |
| HUM 302 Humanities in the Western World L/HU, H ............... 4 |
| Three approved upper-division HUM courses ........................ 9 |
| Total ................................................................. 20 |

**GRADUATE PROGRAM**

The faculty in the program also offer the M.A. degree in Humanities through the Graduate Committee on Humanities. See the Graduate Catalog for requirements.

**HUMANITIES (HUM)**

| HUM 110 Contemporary Issues in the Humanities, (3) |
| Based on faculty and student interest. |
| HUM 194 Special Topics in the Humanities, (1–4) |

Open to all students. Possible topics:

(a) American Fine Arts. (3)
(b) Comparative Fine and Performing Arts. (3)
(c) Cultures of Ethnic Minorities. (3)
(d) Non-Western Cultures. (3)
(e) Western Historical or Contemporary Cultures. (3)
HUM 200 Encountering the Humanities. (3)  
fall and spring  
Introduction to the languages, methods, and objectives of the study of the interdisciplinary humanities. Intersections of ideas, values, and cultural institutions. Lecture, studio, workshop. Prerequisite: Humanities major.  
General Studies: HU

HUM 260 Introduction to Islam. (3)  
spring  
Examines Islamic beliefs, ceremonies, festivals, and institutions. Assumes no prior knowledge about Islam. Lecture, discussion. Cross-listed as REL 260. Credit is allowed for only HUM 260 or REL 260.  
General Studies: HU, G

HUM 294 Special Topics in the Humanities. (1–4)  
not regularly offered  
Open to all students. Possible topics:  
(a) American Fine Arts. (3)  
(b) Comparative Fine and Performing Arts. (3)  
(c) Cultures of Ethnic Minorities. (3)  
(d) Film and Media Studies. (3)  
(e) Non-Western Cultures. (3)  
HUM 301 Humanities in the Western World. (4)  
fall  
Interrelation of arts and ideas in Western civilization, Hellenic through medieval. 3 hours lecture, 1 discussion meeting per week.  
General Studies: L/HU, H

HUM 302 Humanities in the Western World. (4)  
spring  
Interrelation of arts and ideas in Western civilization, Renaissance to the present. 3 hours lecture, 1 discussion meeting per week.  
General Studies: L/HU, H

HUM 310 Japanese Cities and Cultures to 1800. (3)  
once a year  
Relations among ideas and literary, visual, and performing arts of the ancient aristocracy, medieval samurai, and early modern townpeople. Cross-listed as REL 355. Credit is allowed for only HUM 310 or REL 355.  
General Studies: L/HU, H

HUM 312 Interpreting China’s Classics. (3)  
not regularly offered  
Study of selected Confucian and/or Taoist classics and ways they have been read in both Asian and Western scholarship. Cross-listed as HST 386. Credit is allowed for only HST 386 or HUM 312.  
General Studies: L/HU, H

HUM 331 Sexuality, Race, and Power. (3)  
fall  
Sexuality as an expression of identity politics, social transgression, and racial inequality, as portrayed in international literature, art, and film. Lecture, discussion.  
HUM 340 Contemporary American Film and Popular Culture. (3)  
fall  
Study of American film, television, and popular music of past three decades as cultural documents.  
General Studies: HU

HUM 371 Origins, Evolution, and Creation. (3)  
not regularly offered  
Examines scientific, mythic, and religious ideas relating to origins (particularly human). Place of antievolutionism and “scientific creationism” in American culture. Lecture, discussion. Cross-listed as BIO 344/HPS 331/REL 383. Credit is allowed for only BIO 344 or HPS 331 or HUM 371 or REL 383.  

HUM 372 The Darwinian Revolution. (3)  
not regularly offered  
Intellectual and cultural history of Darwinism and modern evolutionary theory and their impact on 19th- and 20th-century thought. Lecture, discussion. Cross-listed as BIO 346/HPS 332. Credit is allowed for only BIO 346 or HPS 332 or HUM 372.  

HUM 394 Special Topics in the Humanities. (1–4)  
not regularly offered  
Open to all students. Possible topics:  
(a) Comedy and Culture. (3)  
(b) Global Media Studies. (3)  
(c) Italian/American Culture. (3)  
(d) Uses and Abuses of Classical Antiquity. (3)  
HUM 395 Technology and Culture. (3)  
spring  
Explores sociocultural, ideological, and postmodern implications of technology and the role technology plays in social constructions as well as the spaces it creates. Seminar, discussion.  
HUM 401 The Culture and Legacy of the European Enlightenment. (3)  
spring  
Historical survey of 18th-century European enlightenment and its status within contemporary intellectual culture. Lecture, discussion.  
General Studies: HU, H

HUM 420 Interpreting Latin America. (3)  
spring  
Introduces protocols and methodologies for cultural interpretation of Latin America, with emphasis on four principal cities as cultural space.  
General Studies: HU, G, H

HUM 440 Los Angeles and Cultural Theory. (3)  
spring  
Explores protocols and methodologies for cultural interpretation of Los Angeles in literary, film, and musical texts and broader implications for contemporary American society.  
General Studies: L/HU, C

HUM 441 American Jewry Through Film and TV. (3)  
fall  
Examines the connection between Jews and the entertainment industry with reference to the constructions of race, class, and ethnicity. Lecture, discussion.  
HUM 450 Technology and Culture. (3)  
spring  
Explores sociocultural, ideological, and postmodern implications of technology and the role technology plays in social constructions as well as the spaces it creates. Seminar, discussion.  
HUM 460 Postmodern Culture and Interpretation. (3)  
not regularly offered  
Currents and interpretations of postmodern culture; international, comparative perspective on the culture and traditions of contemporary “Europe” and “Americas.” Seminar, discussion.  
General Studies: L

HUM 461 Postcolonial Studies. (3)  
not regularly offered  
Interdisciplinary approach to the culture of European imperialism, independence movements, and contemporary postcolonial societies, focusing on literature, film, and theory. Lecture, discussion.  
HUM 462 Psychoanalysis and Culture. (3)  
fall  
Introduction to intellectual history of psychoanalytic movement of the 20th century and its contribution to humanities disciplines.  
General Studies: L/HU

HUM 465 Narrative in the Human Sciences. (3)  
fall  
Theories of narrative and narrativity in the humanities, concentrating on the problems of specific disciplines and interdisciplinary solutions.  
General Studies: L/HU

HUM 494 Special Topics in the Humanities. (1–4)  
not regularly offered  
Open to all students. Possible topics:  
(a) Comedy and Culture. (3)  
(b) Global Media Studies. (3)  
(c) Italian/American Culture. (3)  
(d) Uses and Abuses of Classical Antiquity. (3)
**HUM 498 Pro-Seminar in the Humanities. (1–7)**
*fall and spring*
Methodologies and comparative theories for the study of relationships between various aspects of culture, the history of ideas, and the arts. For students with a major in Humanities with upper-division standing. May be repeated for a total of 6 semester hours, when topics vary. Possible topics:
(a) Theory and Culture. (3)
General Studies: L/HU
**HUM 501 Introduction to Cultural Theory. (3)**
*fall*
Selective history of cultural theory. Major figures and topics include Marx, Nietzsche, Freud, phenomenology, western Marxism, structuralism, and post-structuralism. Seminar.
**HUM 503 Research and Writing in the Humanities. (3)**
*fall*
Systematic training in humanistic research and writing with particular attention to the interdisciplinary study of culture. Seminar.
**HUM 511 Structures of Knowledge. (3)**
*fall*
Theories and examples of structures of knowledge, including such topics as metaphor, semiotics, and knowledge of the “other.”
**HUM 512 Writing Cultures. (3)**
*spring*
Theories and methods of representing Western and non-Western cultures in literature, history, ethnography, and pictorial media.
**HUM 513 Interpretation of Cultures. (3)**
*once a year*
Methodologies and comparative theories for the study of relationships between various aspects of culture, the history of ideas, and the arts. May be repeated for a total of 6 semester hours, when topics vary.
**HUM 549 Contemporary Critical Theory. (3)**
*once a year*
Advanced survey of major schools of 20th-century literary and critical theory. Lecture, discussion. Cross-listed as ENG 502. Credit is allowed for only ENG 502 or HUM 549.
**HUM 591 Seminar. (1–12)**
*once a year*
Possible topics:
(a) Cultural Productions. (3)
(b) Theory and Culture. (3)
(c) Tragedy: Meaning and Form. (3)
**HUM 598 Special Topics in the Humanities. (1–4)**
*not regularly offered*
Open to all students. Possible topics:
(a) Comparative Fine and Performing Arts. (3)
(b) Cultures of Ethnic Minorities. (3)
(c) Film and Media Studies. (3)
(d) Non-Western Cultures. (3)
(e) Western Historical or Contemporary Cultures. (3)

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**Department of Languages and Literatures**

David William Foster  
*Chair*
(LL 440) 480/965-6281  
[www.asu.edu/clas/dll](http://www.asu.edu/clas/dll)

**REGENTS’ PROFESSORS**

Foster, Keller

**PROFESSORS**

Alexander, Baldini, Ballon-Aguirre, Chambers, Couch, Croft, Curran, Ekmanis, Flys, Guntermann, Horwath, Losse, Valdivieso, Volek, Wetsel, Williams, Wixted, T. Wong

**ASSOCIATE PROFESSORS**

Cota-Cardenas, Garcia-Fernandez, W. Hendrickson, Hernández-G., B. Lafford, Ossipov, Reiman, Sanchez, Senner, Suwarno, Tompkins, Vitullo

**ASSISTANT PROFESSORS**

Acereda, Burton, Candela, Canovas, Choi, Colina, George, Gruzinska, Haberman, Rees, Tipton, Urioste-Azcorra

**LECTURERS**

Bernier, Foard, S. Hendrickson, Lage, Martinez, McMillan, Petersen, Sherman, Stiftel, Walton-Ramirez, E. Wong

**INSTRUCTORS**

Deal, Le, Oh, Pang

**ASSOCIATE RESEARCH PROFESSIONAL**

P. Lafford

**ASSISTANT RESEARCH PROFESSIONAL**

Orlich

**ACADEMIC ASSOCIATE**

Glessner

**BACHELOR OF ARTS DEGREE**

The faculty in the Department of Languages and Literatures offer majors in Asian Languages (Chinese/Japanese), French, German, Italian, Russian, and Spanish. Each major 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 at the 300 or 400 level and must include at least nine hours at the 400 level. Specific required courses for each major area are shown in this section and in a brochure available in the department. See “College Degree Requirements,” page 319.
MAJORS

Asian Languages (Chinese/Japanese)—B.A.

Students majoring in Asian Languages (Chinese/Japanese) may select a course of study that focuses on either language. The major requires 45 semester hours.

Chinese. At least nine semester hours must be at the 400 level. In addition to the courses shown below, the student must meet with an advisor and choose at least 15 semester hours of courses, including six semester hours of JPN courses such as Japanese language and calligraphy, Japanese literature in translation (FLA 421) or KOR prefix courses such as Korean language and/or Korean culture, and nine semester hours from appropriate courses in art, humanities, social and behavioral sciences, and business.

Required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI 313</td>
<td>Advanced Chinese G</td>
<td>3</td>
</tr>
<tr>
<td>CHI 314</td>
<td>Advanced Chinese G</td>
<td>3</td>
</tr>
<tr>
<td>CHI 321</td>
<td>Chinese Literature L/HU</td>
<td>3</td>
</tr>
<tr>
<td>CHI 322</td>
<td>Chinese Literature L/HU, G</td>
<td>3</td>
</tr>
<tr>
<td>or FLA 420</td>
<td>Foreign Literature in Translation HU, G (3)</td>
<td></td>
</tr>
<tr>
<td>CHI 413</td>
<td>Introduction to Classical Chinese HU</td>
<td>3</td>
</tr>
<tr>
<td>CHI 414</td>
<td>Introduction to Classical Chinese HU</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 18 semester hours

Electives

Choose six semester hours from the courses below.

- CHI 309 | Chinese Conversation (2) | 6
- CHI 310 | Chinese Conversation (2) | 6
- CHI 311 | Chinese Conversation (2) | 6
- CHI 312 | Chinese Conversation (2) | 6
- CHI 494 | Special Topics (1–4) | 6
- CHI 499 | Individualized Instruction (1–3) | 6

Total: 6 semester hours

Recommended

Two 200-level CHI courses (excluding 205) | 6

Japanese. At least nine semester hours must be taken from FLA 421, and JPN 321 and 414. No more than eight semester hours may be selected from JPN 309, 310, 311, and 312.

Required

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLA 421</td>
<td>Japanese Literature in Translation L/HU, G</td>
<td>3</td>
</tr>
<tr>
<td>JPN 313</td>
<td>Advanced Japanese G</td>
<td>3</td>
</tr>
<tr>
<td>JPN 314</td>
<td>Advanced Japanese G</td>
<td>3</td>
</tr>
<tr>
<td>JPN 321</td>
<td>Japanese Literature L/HU, G</td>
<td>3</td>
</tr>
<tr>
<td>JPN 414</td>
<td>Introduction to Classical Japanese</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 15 semester hours

Electives

Choose nine semester hours from the courses below.

- JPN 309 | Intermediate Japanese Conversation (2) | 9
- JPN 310 | Intermediate Japanese Conversation (2) | 9
- JPN 311 | Japanese Conversation and Composition G (3) | 9
- JPN 312 | Japanese Conversation and Composition G (3) | 9
- JPN 321 | Japanese Literature (3) L/HU, G | 9
- JPN 394 | Special Topics (1–4) | 9
- JPN 435 | Advanced Readings (3) | 9
- JPN 485 | Problems of Translation (3) | 9
- JPN 494 | Special Topics (1–4) | 9

For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
Choose six semester hours from the courses below.

**Italian—B.A.**

**Required**

- ITA 311 Italian Composition and Conversation \( G \) ............... 3
- ITA 312 Italian Composition and Conversation \( G \) ............... 3
- ITA 325 Introduction to Italian Literature \( HU \) ............... 3

**Total** ................................................................. 15

Note: ITA 394 Commercial Italian may substitute for either ITA 311 or 312.

Fifteen semester hours are required from the following list, including at least nine semester hours from the 400 level:

- ITA 314 Advanced Italian \( G \) ........................................... 3
- ITA 394 Special Topics ..................................................... 1–4
- ITA 415 Italian Civilization \( HU, G \) .................................... 3
- ITA 420 Italian Cinema ...................................................... 3
- ITA 430 Italian Literature of the Middle Ages \( HU \) ............ 3
- ITA 441 Dante: *Divina Commedia* \( HU \) ......................... 3
- ITA 443 Italian Literature of the Renaissance \( HU \) ................. 3
- ITA 446 Italian Literature of the 18th and 19th Centuries \( HU \) ... 3
- ITA 494 Special Topics ..................................................... 1–4
- ITA 499 Individualized Instruction .................................. 1–3

In addition to the courses shown above, the student must meet with an advisor and choose at least 15 semester hours of courses from appropriate social and behavioral science, humanities, business courses, and other language courses.

**Spanish—B.A.**

**Required**

- SPA 313 Spanish Conversation and Composition \( G \) ............... 3
- SPA 314 Spanish Conversation and Composition \( G \) ............... 3
- SPA 315 Spanish Conversation and Composition for Bilinguals (3)
- SPA 316 Spanish Conversation and Composition for Bilinguals (3)
- SPA 325 Introduction to Hispanic Literature \( HU \) ............... 3
- SPA 412 Advanced Conversation and Composition \( G \) ............. 3
- SPA 425 Spanish Literature \( HU \) ............................................ 3

Choose two courses below ................................................. 6

- SPA 426 Spanish Literature \( HU \) (3)
- SPA 427 Spanish American Literature \( L \) (3)
- SPA 428 Spanish American Literature \( L, G \) (3)

Choose one course below .................................................... 3

- SPA 471 Civilization of the Spanish Southwest \( HU \) (3)
- SPA 472 Spanish American Civilization \( HU, G, H \) (3)
- SPA 473 Spanish Civilization \( HU/SB, G \) (3)

**Total** .............................................................................. 24

**Electives**

Two upper-division (300-400-level) SPA courses ......................... 6

**Related Fields**

- POR 101 Elementary Portuguese ...................................... 5
- POR 201 Intermediate Portuguese \( G \) ................................. 5

In addition to these courses, the student must meet with an advisor and choose at least six semester hours of courses from appropriate social and behavioral science, humanities, business courses, and other romance language courses.

**MINORS**

Each minor in Asian Languages (Chinese/Japanese), French, German, Italian, Russian, and Spanish consists of 18 hours, of which 12 hours must be in the upper division. In addition, specific required courses for each area follow and are in a brochure in the department.
Chinese

Required
CHI 313 Advanced Chinese G ................................................. 3
CHI 314 Advanced Chinese G ................................................. 3

Consult with the departmental advisor for other courses.

French

Required
FRE 311 French Conversation G ............................................. 3
FRE 312 French Composition G .............................................. 3
FRE 321 French Literature L/HU, H ............................................ 3
or FRE 322 French Literature L/HU (3)

Consult with the departmental advisor for other courses.

Twelve hours must be at the 300 level or above.

German

Required
GER 311 German Conversation G ............................................ 3
GER 312 German Composition G ............................................ 3
One 400-level GER course ..................................................... 3
Upper-division GER course ................................................... 3

Consult with the departmental advisor for other courses.

Italian

Required
ITA 311 Italian Composition and Conversation G ...................... 3
or ITA 312 Italian Composition and Conversation G (3)
ITA 325 Introduction to Italian Literature HU ........................... 3
One 400-level ITA course ...................................................... 3

Consult with the departmental advisor for other courses.

Japanese

Required
JPN 313 Advanced Japanese G ................................................ 3
JPN 314 Advanced Japanese G ................................................ 3

Consult with the departmental advisor for other courses.

Russian

Required
RUS 303 Scientific Russian ................................................... 3
RUS 304 Scientific Russian ................................................... 3
RUS 311 Russian Composition and Conversation G .................. 3
RUS 312 Russian Composition and Conversation G .................. 3

RUS 211 and 212 are the only lower-division courses that may count toward the Russian minor.

Consult with the departmental advisor for other courses.

Spanish

The minor in Spanish requires a minimum of 18 upper-division semester hours.

Required
SPA 313 Spanish Conversation and Composition G ................. 3
SPA 314 Spanish Conversation and Composition G ................. 3
or SPA 315 Spanish Conversation and Composition for Bilinguals (3)
SPA 315 Spanish Conversation and Composition G ................. 3
or SPA 316 Spanish Conversation and Composition for Bilinguals (3)
SPA 325 Introduction to Hispanic Literature HU ...................... 3
SPA 413 Advanced Spanish Grammar G ................................ 3
SPA 471 Civilization of the Spanish Southwest HU .................... 3
or SPA 472 Spanish American Civilization HU, G, H (3)
or SPA 473 Spanish Civilization HU/SB, G (3)

SPA 311 and 312 are not counted toward the major or minor in Spanish.

CERTIFICATES AND EMPHASES

The following are certificate programs or emphases offered in the Department of Languages and Literatures. For more information, see “Certificate Programs and Areas of Emphasis,” page 324.

Asian Studies Certificate. Foreign language students majoring in Asian Languages (Chinese/Japanese) may elect to pursue an Asian Studies Certificate combining courses from the major with selected outside courses of wholly Asian content.

Latin American Studies Certificate. Foreign language students majoring in Spanish may elect to pursue a Latin American Studies Certificate combining courses from the major with selected outside courses of wholly Latin American content.

Russian and East European Studies Certificate. Any undergraduate major can earn a Russian and East European Studies Certificate by successfully completing one of the options mentioned in the section on “Russian and East European Studies,” page 326.

Scandinavian Studies Certificate. Any undergraduate major can earn a Scandinavian Studies Certificate.

Southeast Asian Studies Certificate. To earn a Southeast Asian Studies Certificate, a student must complete a minimum of 40 semester hours of course work related to Southeast Asia, including two years (20 semester hours) of a Southeast Asian language.

Translation Certificate (Spanish/English). The Translation Certificate program 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, and law, in accordance with guidelines recommended by the American Translators’ Association. The certificate is a nondegree program consisting of 12 semester hours of course work and two hours of in-service practicum primarily into the receptor language of English from the source language of Spanish. It may be taken simultaneously with course work leading to an undergraduate or graduate degree, as a

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
related area sequence, or as the sole program of study for members of the community who meet the admission requirements of the certificate program and are enrolled in the university. A complete brochure is available at the Department of Languages and Literatures in LL 440.

While the certificate program is not yet available in French, FRE translation courses may be available. See the Schedule of Classes for course offerings.

**Admission Requirements.** Since entrance to professional translation is through work, cultural experience, and examination, the two entrance requirements to this certificate program are (1) 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 Spanish, which at ASU is SPA 412, and (2) either an academic year at a university in a Spanish-speaking country, an extensive work experience using Spanish, or demonstrated bilingual facility, both written and oral, in English and Spanish.

**Certificate Requirements.** The certificate program consists of the following requirements:

**Prerequisites**
- FLA 400 Linguistics S8 .................................................. 3
  - or SPA 494 ST: Introduction to Hispanic Linguistics (3)
  - or equivalent
- SPA 413 Advanced Spanish Grammar G........................... 3
- SPA 494 ST: Lexicography .............................................. 3

**Required**
- FLA 401 Translation Theory and Practice ........................ 3

**In-Service Practicum**
- FLA 484 Internship .................................................... 2

- Also required are nine hours of applied translation electives in specialized areas chosen from the following courses:
  - FLA 481 Technical and Scientific Translation .................. 3
  - FLA 482 Business and Financial Translation.................. 3
  - FLA 483 Medical and Legal Translation .......................... 3
  - FLA 485 Problems of Literary Translation ...................... 3

**B.I.S. CONCENTRATION AREAS**

Students seeking to focus on a language as one of their concentration areas for the Bachelor of Interdisciplinary Studies degree may choose from Chinese, French, German, Italian, Japanese, Russian, and Spanish. They may also choose from any of the approved certificate programs. The requirements for the Bachelor of Arts in Interdisciplinary Studies (B.I.S.) concentrations are the same for the minor in that language. See “Minors,” page 386, for specific course requirements. For more information, see “Division of Undergraduate Academic Services,” page 107.

**SECONDARY EDUCATION—B.A.E.**

**French, German, Japanese, and Spanish.** Each of the major teaching fields in French, German, Japanese, and 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 academic specialization, a minimum of 24 hours must be taken at the 300 or 400 level and must include at least nine hours at the 400 level. Specific required courses for each major area are listed in curriculum check sheets of the individual language areas available in the department.

Applications are not being accepted at this time for Chinese and Russian.

**GRADUATE PROGRAMS**

The faculty in the Department of Languages and Literatures offer programs leading to the M.A. degree in French, German, and Spanish and the Ph.D. degree in Spanish. See the Graduate Catalog for requirements.

**FOREIGN LANGUAGES FOR INTERNATIONAL PROFESSIONS**

The sequence of two semesters, listed under numbers 107 and 207 in two languages (French 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 also satisfies the college’s foreign language requirement. 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 eight semester hours in each of two semesters.

Students 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 Languages and Literatures before registration.

**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. This normally includes a sequence of courses numbered 101 and 102 and 201 and 202 or 107 and 207. However, important exceptions exist in Greek, Latin, Portuguese, and Romanian.

**Greek.** To satisfy the foreign language requirement, students must take GRK 301 and 302.

**Latin.** Students entering LAT 202 directly from LAT 102 must complete LAT 201 to satisfy the College of Liberal Arts and Sciences requirement.

**Portuguese.** To satisfy the foreign language requirement, students must take POR 314 or a higher numbered POR course.

**Romanian.** To satisfy the foreign language requirement, students must complete ROM 314.

**FOREIGN LANGUAGE PLACEMENT**

Students who transfer from other postsecondary institutions with foreign language credits below the 202 level are placed in a course at the level directly above the work completed.

Students who have completed their secondary education at a school in which the language of instruction was not English are considered to have satisfied the foreign language requirement. Certification of this status is made at the
time of admission to ASU. Questions should be addressed to the foreign credentials evaluator at Undergraduate Admissions.

The foreign language requirement can be met in languages not taught at ASU either by transferring credit from another institution or by passing a proficiency examination. When possible, the Department of Languages and Literatures recommends to the college an appropriate source for such examinations and proctors them. Grading is done by the institution that provides the examination, and the student pays any costs incurred. The examination can be used only to demonstrate proficiency; it does not produce semester hours of credit.

Students desiring placement above the 101-level course in French, German, or Spanish should take the placement exam for that language in the Computer Language Laboratory in LL 65.

Ordinarily, no placement or proficiency examination is administered to students who wish to continue studying languages for which high school credits have been earned. Students should be guided by the following principles of equivalency: (1) one unit (one academic year) of high school-level study is 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); students with two years of high school study, in the third semester course (201), and so on. (2) Students who feel that their high school language preparation was inadequate may choose to place themselves in 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 meet the college foreign language requirement in any one of the following ways:

1. by satisfactory results in a nonrepeatable college-approved 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 taught in the language for which the last course of the required sequence is a prerequisite.

Students are expected to follow the progressive sequence of 100, 200, and 300. Once a grade of “C” or higher is earned in a 300-level class in a language, students may not earn lower-division credit in that language.

First-year foreign language courses taught by the Department of Languages and Literatures are not open to students who have spent one or more years in a country where that language is the predominant language. Individual language areas may have different policies. Students with questions about this policy should check with the appropriate language coordinator in the department.

If transfer students are uncertain about course equivalencies, they should contact the Department of Languages and Literatures.

LANGUAGES LABORATORY REQUIREMENT (LAG)

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 or in other assigned audio-lingual tape exercises in addition to the regular class periods.

FOREIGN LANGUAGES (FLA)

FLA 150 Introduction to East Asian Culture. (3)

spring
Introduction to the cultures of China, Japan, and Korea.
General Studies: HU, G

FLA 323 Survey of Literature of the Soviet Era in Translation. (3)

fall and spring
Surveys main literary movements, prominent authors, most significant works of prose, poetry, and drama of the Soviet period, 1917–1991.
General Studies: L/HU, G

FLA 400 Linguistics. (3)

spring
Introduction to the analysis of language and its use in social contexts.
Topics: morphology, phonology, pragmatics, semantics, syntax, and variation. Prerequisites: junior standing; instructor approval.
General Studies: SB

FLA 401 Translation Theory and Practice. (3)

not regularly offered
Translation theories and professional practices and ethics; bibliography, computer technology, and sample texts for natural and social sciences and humanities. Prerequisite: 4th-year composition or instructor approval in respective language area.

FLA 415 Bilingualism and Languages in Contact. (3)

tail
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 its equivalent) or instructor approval.

FLA 420 Foreign Literature in Translation. (3)

tail and spring
Not for language majors (except in Asian languages and Russian); open to language majors as a related-area course. Graduate students by permission. Possible topics:
(a) Brazilian
(b) Chinese
(c) French
(d) German
(e) Greek
(f) Italian
(g) Latin
(h) Portuguese
(i) Russian
(j) Soviet
(k) Spanish
(l) Spanish American
General Studies: HU, G

FLA 421 Japanese Literature in Translation. (3)

tail and spring
Readings selected by theme or genre or period from various works of Japanese literature in English translation. May be repeated when topics vary. Graduate students by permission. Prerequisite: General Studies L course.
General Studies: L/HU, G

FLA 480 Methods of Teaching Foreign Languages. (3)

tail
Teaching foreign languages and literatures at secondary and college levels. Does not meet the Liberal Arts and Sciences General Studies requirement for humanities and fine arts. Required for admission to SED 478. Prerequisite: 12 hours of upper-division courses in 1 foreign language.

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FLA 481 Technical and Scientific Translation. (3) 
not regularly offered
Resources, practices, strategies, and lexicon for translation of professional texts in subjects such as engineering, architecture, agriculture, computer technology, electronics, and physical and biological sciences. Prerequisite: FLA 401.

FLA 482 Business and Financial Translation. (3) 
not regularly offered
Resources, practices, strategies, and lexicon for translation of professional texts in subjects such as economics, finance, insurance, management, marketing, accounting, advertising, and real estate. Prerequisite: FLA 401.

FLA 483 Medical and Legal Translation. (3) 
not regularly offered
Resources and strategies for translation of professional texts in subjects such as medicine, nursing, public health, criminal justice, and international law. May be repeated for a total of 6 semester hours. Prerequisite: FLA 401.

FLA 484 Internship. (1–12) 
not regularly offered
FLA 485 Problems of Literary Translation. (3) 
not regularly offered
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.

FLA 494 Special Topics. (1–4) 
not regularly offered
Various topics.

FLA 515 Second Language Acquisition. (3) 
spring
Discussion and application of theories of second language acquisition. Prerequisite: FLA 400 (or its equivalent).

FLA 525 Trends and Issues in Foreign Language Teaching. (3) 
not regularly offered
Advanced methods seminar, designed for experienced teachers.

ARABIC (ARB)

ARB 101 Elementary Arabic. (4) 
fall
Reading, writing, speaking, and understanding basic Arabic. 4 hours lecture, 1 hour lab.

ARB 102 Elementary Arabic. (4) 
spring
Reading, writing, speaking, and understanding basic Arabic. 4 hours lecture, 1 hour lab. Prerequisite: ARB 101 (or its equivalent).

ARB 201 Intermediate Arabic. (4) 
fall
Review of Arabic grammar with emphasis on the development of the skills of listening comprehension, reading, speaking, and writing. 4 hours lecture, 1 hour lab. Prerequisite: ARB 102 (or its equivalent). General Studies: G

ARB 202 Intermediate Arabic. (4) 
spring
Review of Arabic grammar with emphasis on the development of the skills of listening comprehension, reading, speaking, and writing. 4 hours lecture, 1 hour lab. Prerequisite: ARB 201 (or its equivalent). General Studies: G

CHINESE (CHI)

CHI 101 Elementary Chinese. (5) 
fall
Pronunciation, grammar, elementary conversation, and development of basic reading and writing skills. Standard dialect. 5 class hours. Fee.

CHI 102 Elementary Chinese. (5) 
spring
See CHI 101. Fee. Prerequisite: CHI 101 (or its equivalent).

CHI 107 Chinese for International Professions I. (10) 
fall
Accelerated program alternative to CHI 101, 102 sequence. Functional approach to needs of international professions. 10 class hours. Fee.

CHI 201 Intermediate Chinese. (5) 
fall
Systematic review of grammar. Development of vocabulary through reading and writing. Drill in aural/oral skills. 5 class hours. Prerequisite: CHI 102 (or its equivalent). General Studies: G

CHI 202 Intermediate Chinese. (5) 
spring
See CHI 201. Prerequisite: CHI 201 (or its equivalent). General Studies: G

CHI 205 Chinese Calligraphy. (1) 
fall and spring
Introduction to styles and techniques of Chinese writing. Knowledge of Chinese or Japanese is not required.

CHI 207 Chinese for International Professions II. (10) 
spring
Continuation of CHI 107, alternative to CHI 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. 10 class hours. Prerequisite: CHI 107 or instructor approval. General Studies: G

CHI 309 Chinese Conversation. (2) 
fall
Aural/oral drills using contemporary stories, articles, and essays. For students with lower-level proficiency. Prerequisite: CHI 202.

CHI 310 Chinese Conversation. (2) 
spring
See CHI 309. Prerequisite: CHI 202.

CHI 311 Chinese Conversation. (2) 
fall
Intensive aural/oral practice in modern Chinese. For students who have lived in China or a Chinese-speaking environment. Discussion, drill. Prerequisite: CHI 202.

CHI 312 Chinese Conversation. (2) 
spring
See CHI 311. Discussion, drill. Prerequisite: CHI 202.

CHI 313 Advanced Chinese. (3) 
fall
Modern language in general or specific areas depending on the student’s needs or interests. 3 hours lecture, arranged lab. Prerequisite: CHI 202 (or its equivalent). General Studies: G

CHI 314 Advanced Chinese. (3) 
spring
Continuation of CHI 313. Prerequisite: CHI 313. General Studies: G

CHI 321 Chinese Literature. (3) 
fall
Masterworks of the tradition from the 6th century B.C.E. through the 13th century. Readings, lectures, and examinations are in English. General Studies: L/HU

CHI 322 Chinese Literature. (3) 
spring
Masterpieces from the later tradition and its transition to modern times. Readings, lectures, and examinations are in English. General Studies: L/HU, G

CHI 413 Introduction to Classical Chinese. (3) 
fall
Reading in various genres of pre-20th century literature (wen-yen), with analysis of the structure of the classical writings. Prerequisite: CHI 314 or instructor approval. General Studies: HU

CHI 414 Introduction to Classical Chinese. (3) 
spring
Continuation of CHI 413. Prerequisite: CHI 413. General Studies: HU

CHI 494 Special Topics. (1–4) 
not regularly offered

CHI 499 Individualized Instruction. (1–3) 
not regularly offered

CHI 500 Bibliography and Research Methods. (3) 
not regularly offered
Introduction to research materials on China in Chinese, Japanese, and Western languages. Overview of research methods. Lecture, discussion.
CHI 514 Advanced Classical Chinese. (3)  
not regularly offered  
Close readings in selected premodern texts, with focus on special grammatical features, and increased vocabulary. Lecture, discussion.

CHI 520 Teaching of Chinese as a Second Language. (3)  
not regularly offered  
Theory and practice of teaching Chinese, including presentation, interaction, and evaluation, with consideration given to cultural factors. Lecture, discussion.

CHI 535 Advanced Readings. (3)  
not regularly offered  
Readings in primary and secondary sources in history, art, religious studies, economics, or other fields. Lecture, discussion.

CHI 543 Chinese Language and Linguistics. (3)  
fall  
Analysis and discussion, within the framework of linguistic theory, of selected problems in Chinese phonetics, morphology, and syntax. Lecture, discussion.

CHI 585 Problems of Translation. (3)  
not regularly offered  
Theories and practice of translation: strategies for handling a variety of Chinese texts. Lecture, discussion.

CHI 591 Seminar. (3)  
not regularly offered  
Topics in literary, linguistic, or cultural studies.

FRENCH (FRE)

FRE 101 Elementary French. (4)  
fall, spring, summer  
Intensive aural/oral drill in class and laboratory; basic grammar supplemented by simple prose readings. Not open to students with credit for FRE 111. 4 hours lecture, 1 hour lab. Fee.

FRE 102 Elementary French. (4)  
fall, spring, summer  
See FRE 101. Fee. Prerequisite: FRE 101 (or its equivalent).

FRE 107 French for International Professions I. (4)  
fall  
Accelerated alternative to FRE 101 and 102 or FRE 111. Functional approach. Emphasis on communicative competence for international professions. Fee.

FRE 111 Fundamentals of French. (4)  
fall and spring  
Primarily for students with two years of high school French who need review to enter second year study. Not open to students with credit for FRE 101 or 102 or 107. 4 hours lecture, 1 hour lab. Fee.

FRE 201 Intermediate French I. (4)  
fall, spring, summer  
Grammar review, with emphasis on development of skills of speaking, reading, writing, and listening comprehension. 4 hours lecture; 1 hour lab. Fee. Prerequisite: FRE 102 or 111 (or its equivalent). General Studies: G

FRE 202 Intermediate French II. (4)  
fall, spring, summer  
Continuation of grammar review with emphasis on development of skills in speaking, reading, writing, and listening comprehension. 4 hours lecture, 1 hour lab. Fee. Prerequisite: FRE 201 (or its equivalent). General Studies: G

FRE 205 Readings in French Literature. (3)  
fall, spring, summer  
Designed to teach reading with facility and comprehension. Vocabulary building and textual analysis of literary genres are major elements. Prerequisite: FRE 202 (or its equivalent). General Studies: G

FRE 207 French for International Professions II. (8)  
spring  
Continuation of FRE 107, alternative to FRE 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Fee. Prerequisite: FRE 107 or instructor approval. General Studies: G

FRE 311 French Conversation. (3)  
tall and spring  
Further practice in speaking French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: 8 hours of 200-level French (or its equivalent). General Studies: G

FRE 312 French Composition. (3)  
tall and spring  
Further practice in writing French, emphasizing current usage and promoting facility in the expression of ideas. Prerequisite: 8 hours of 200-level French (or its equivalent). General Studies: G

FRE 315 French Phonetics. (3)  
spring  
Practice and theory of French pronunciation. Emphasis on standard French, although an overview of regional varieties is offered. Lecture and lab. Prerequisite: FRE 311 (or its equivalent).

FRE 319 Business French. (3)  
spring  
Introduction to the structure, vocabulary, and practices of the French business world. Prerequisite: FRE 312 or instructor approval. General Studies: G

FRE 321 French Literature. (3)  
tall and spring  
Representative masterpieces and significant movements of French literature of the Middle Ages through the 18th century. Prerequisite: FRE 205 (or its equivalent). General Studies: L/HU, H

FRE 322 French Literature. (3)  
tall and spring  
Literature of the 19th and 20th centuries. Prerequisite: FRE 205 (or its equivalent). General Studies: L/HU

FRE 411 Advanced Spoken French. (3)  
tall and spring  
Improvement of spoken French. Prerequisites: FRE 311 and 6 hours of 300-level French (or their equivalents). General Studies: G

FRE 412 Advanced Written French. (3)  
tall and spring  
Improvement of composition skills. Prerequisites: FRE 312 and 6 hours of 300-level French (or their equivalents).

FRE 415 French Civilization I. (3)  
tall  
Political, intellectual, social, economic, and artistic development of France from its origins to the end of the 17th century. Prerequisite: 6 hours of upper-division French. General Studies: HU

FRE 416 French Civilization II. (3)  
spring  
Political, intellectual, social, economic, and artistic development of France from the 18th century to present. Prerequisite: 6 hours of upper-division French. General Studies: HU, G

FRE 421 Structure of French. (3)  
tall  
Phonology, morphology, syntax, semantics, and varieties of French. Prerequisites: both FRE 311 and 312 or only instructor approval.

FRE 422 Applied French Linguistics. (3)  
spring  
Applies linguistic theory and second language acquisition theory to teaching of French. Prerequisite: ASB 480 or ENG 213 or FLA 400.

FRE 423 French Syntax. (3)  
tall  
Analysis of French syntactic structure by contemporary theoretical models. Prerequisite: ASB 480 or ENG 213 or FLA 400.

FRE 424 French Phonology. (3)  
spring  
Introduction to phonological theory and its application to French. Prerequisites: both FRE 311 and 312 or only instructor approval.

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FRE 441 French Literature of the 17th Century. (3)  
not regularly offered  
From 1600 to 1660. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.  
General Studies: HU  
FRE 442 French Literature of the 17th Century. (3)  
not regularly offered  
From 1660 to 1700. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.  
General Studies: HU  
FRE 445 French Literature of the 18th Century. (3)  
not regularly offered  
Contributions of the philosophers and the development of the novel and drama. Prerequisites: both FRE 321 and 6 hours of 300-level French or only instructor approval.  
General Studies: L/HU  
FRE 451 French Poetry of the 19th Century. (3)  
not regularly offered  
From Romanticism to Parnassian poetry to Symbolism. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.  
General Studies: L/HU  
FRE 452 French Novel of the 19th Century. (3)  
not regularly offered  
From Constant, Hugo, Balzac, Stendhal, and Sand to Flaubert and Zola, with emphasis on major literary movements. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.  
General Studies: L/HU  
FRE 453 Theater of the 19th Century. (3)  
not regularly offered  
From Romantic drama to the Symbolist Theater. Representative plays of Hugo, Musset, Vigny, Dumas, Beque, Rostand, Feydeau, and Mirbeau. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.  
General Studies: L/HU  
FRE 461 Modern Narrative. (3)  
fall  
Representative authors from Gide to the new Nouveau Roman. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.  
General Studies: HU  
FRE 462 Modern Poetry. (3)  
spring  
Representative authors from Mallarme to Bonnefoy. Lecture, discussion. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.  
General Studies: HU  
FRE 471 The Literature of Francophone Africa and the Caribbean. (3)  
not regularly offered  
Selected prose, poetry, and drama of black authors from Africa and the Caribbean. Prerequisites: both FRE 322 and 6 hours of 300-level French or only instructor approval.  
General Studies: L/HU  
FRE 472 Franco-Canadian Civilization. (3)  
spring  
Study of the civilization of Quebec in particular through its history, language, literature, music, and customs. Prerequisite: 9 hours of 300-level French or instructor approval.  
FRE 494 Special Topics. (1–4)  
not regularly offered  
FRE 499 Individualized Instruction. (1–3)  
not regularly offered  
FRE 500 Bibliography and Research Methods. (3)  
fall  
Required of all graduate students.  
FRE 510 Explication de Textes. (3)  
not regularly offered  
Detailed analysis of literary texts.  
FRE 515 Intellectual Currents in France, from the Middle Ages to the 18th Century. (3)  
not regularly offered  
Significant social, aesthetic, philosophic, and scientific ideas as presented by major writers of fiction and nonfiction.  
FRE 516 Intellectual Currents in France, from the 19th Century to the 20th Century. (3)  
not regularly offered  
See FRE 515.  
FRE 521 History of the French Language. (3)  
not regularly offered  
Principal phonological, morphological, and semantic developments of French from Latin to present, with emphasis on Old and Middle French. Some familiarity with Latin is recommended.  
FRE 531 Medieval French Literature. (3)  
fall  
Readings in the epics, early drama, roman courtois, and other representative literary genres of the Middle Ages.  
FRE 535 French Literature of the 16th Century. (3)  
spring  
Readings in French Renaissance literature with special attention to the humanist movement and to Rabelais, Montaigne, and the Pleiade.  
FRE 591 Seminar. (1–12)  
not regularly offered  
Possible topics:  
(a) Advanced Problems in French Literature. (3)  
(b) Balzac. (3)  
(c) Corneille, Molière, and Racine. (3)  
(d) Diderot, Voltaire, and Rousseau. (3)  
(e) Flaubert. (3)  
(f) French Existentialist Literature. (3)  
(g) French Literary Criticism. (3)  
(h) Proust. (3)  
(i) Realism and Naturalism. (3)  
(j) Romanticism. (3)  
(k) Stendhal and Zola. (3)  

GERMAN (GER)  
GER 101 Elementary German. (4)  
fall, spring, summer  
Reading, writing, speaking, and understanding of basic German, with emphasis on pronunciation and grammar. Credit is allowed for only GER 101 or 111. 4 hours lecture, 1 hour lab. Fee.  
GER 102 Elementary German. (4)  
fall, spring, summer  
See GER 101. Credit is allowed for only GER 102 or 111. Fee. Prerequisite: GER 101 (or its equivalent).  
GER 111 Fundamentals of German. (4)  
fall and spring  
Primarily for students with two years of high school German who need review to enter second-year study. Credit is allowed for only GER 111 or both GER 101 and 102. 4 hours lecture, 1 hour lab. Fee.  
GER 201 Intermediate German. (4)  
fall, spring, summer  
Intensive review of grammar, with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: GER 102 or 111 (or its equivalent).  
General Studies: G  
GER 202 Intermediate German. (4)  
fall, spring, summer  
See GER 201. Fee. Prerequisite: GER 201 (or its equivalent).  
General Studies: G  
GER 303 Scientific German. (3)  
not regularly offered  
Acquisition of a specialized vocabulary through the reading of German scientific publications. Prerequisite: GER 202 (or its equivalent).  
GER 304 Scientific German. (3)  
not regularly offered  
See GER 303. Prerequisite: GER 202 (or its equivalent).  
GER 311 German Conversation. (3)  
fall  
Expansion of idiom through oral practice dealing with contemporary articles, essays, and stories. 3 semester hours limit for majors. Prerequisite: GER 202 (or its equivalent).  
General Studies: G  
GER 312 German Conversation. (3)  
spring  
See GER 311. Prerequisite: GER 202 (or its equivalent).  
General Studies: G
GER 313 German Composition. (3)  
*spring*  
Intensive practice in writing, emphasizing style and grammar. Prerequisite: GER 202 (or its equivalent).  
*General Studies: G*

GER 314 Introduction to German Literature. (3)  
*fall*  
Beginning study of German poetry, drama, the novel, and the Novelle. Prerequisite: GER 202 (or its equivalent).  
*General Studies: G*

GER 319 Business Correspondence and Communication. (3)  
*not regularly offered*  
Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. Prerequisite: GER 313 or instructor approval.  
*General Studies: G*

GER 394 Special Topics. (1–4)  
*not regularly offered*  
Special topics are concerned with a figure, theme, or work in German literature or Germanic studies. Possible topics:  
(a) Faust. (3)  
(b) Germanic Studies. (3)  
(c) Goethe. (3)  
(d) Grass and Böll. (3)  
(e) Hesse. (3)  
(f) Kafka. (3)  
(g) Kleist. (3)  
(h) Schiller. (3)

GER 411 Advanced Grammar and Conversation. (3)  
*fall*  
Improvement of diction and idiom through intensive oral review. Prerequisite: GER 311 or 312 (or its equivalent).  
*General Studies: G*

GER 412 Advanced Grammar and Composition. (3)  
*spring*  
Improvement of writing ability. Prerequisite: GER 313 (or its equivalent).  
*General Studies: G*

GER 415 German Civilization. (3)  
*spring*  
Aspects of political, social, and cultural life of the German-speaking world from the beginning through 1600. Prerequisite: any 300-level German course or instructor approval.  
*General Studies: HU, H*

GER 416 German Civilization. (3)  
*fall*  
From 1600 through 1945. Prerequisite: any 300-level German course or instructor approval.  
*General Studies: HU, H*

GER 421 German Literature. (3)  
*fall*  
From the beginning to Classicism. Prerequisite: 6 hours of 300-level German.  
*General Studies: HU*

GER 422 German Literature. (3)  
*spring*  
From Romanticism to the present. Prerequisite: 6 hours of 300-level German.  
*General Studies: L/HU*

GER 445 German Literature: Enlightenment to Classicism. (3)  
*not regularly offered*  
Major works of the literary epochs in the century. Prerequisite: GER 421 or instructor approval.  
*General Studies: HU, H*

GER 451 German Literature: Biedermeier to Naturalism. (3)  
*not regularly offered*  
Representative works of prose and poetry from 1820 to 1890. Prerequisite: GER 422 or instructor approval.  
*General Studies: HU, G, H*

GER 453 German Literary Masterpieces on Film. (3)  
*fall, spring, summer*  
Film and literature in their correlation to each other and to cultural, political, and social trends in German-speaking countries. Special arrangements for graduate students and those without a knowledge of German. Lecture, discussion.  
*General Studies: HU, G, H*

GER 461 Contemporary German Literature. (3)  
*spring and summer*  
German writers since 1945. Prerequisite: GER 422 or instructor approval.  
*General Studies: HU*

GER 494 Special Topics. (1–4)  
*not regularly offered*  
Special topics are concerned with a figure, theme, or work in German literature or Germanic studies. Possible topics:  
(a) Faust. (3)  
(b) Germanic Studies. (3)  
(c) Goethe. (3)  
(d) Grass and Böll. (3)  
(e) Hesse. (3)  
(f) Kafka. (3)  
(g) Kleist. (3)  
(h) Schiller. (3)

ANCIENT GREEK (GRK)

GRK 101 Elementary Ancient Greek. (4)  
*fall*  
Ancient Greek grammar and vocabulary with an emphasis on developing reading skills. For beginning students only.  
*General Studies: L/HU*

GRK 201 Intermediate Ancient Greek. (4)  
*spring*  
Continuation of GRK 101. Increased emphasis on reading texts adapted from Aristophanes, Demosthenes, and Plato. Prerequisite: GRK 101 or instructor approval.  
*General Studies: HU*

GRK 301 Ancient Greek Literature. (3)  
*fall*  
Readings in the masterpieces of ancient Greek literature; advanced grammar. Authors read are changed each year in accordance with the needs of the class. May be repeated for credit. Prerequisite: GRK 201 or instructor approval.  
*General Studies: HU*

GRK 302 Ancient Greek Literature. (3)  
*spring*  
Continuation of GRK 301. Prerequisite: GRK 201 or instructor approval.  
*General Studies: HU*

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
HEBREW (HEB)

HEB 101 Elementary Modern Hebrew. (4)
fall
Reading, writing, speaking, and understanding of basic modern Hebrew, with emphasis on pronunciation and grammar. 4 hours lecture, 1 hour lab. Fee.

HEB 102 Elementary Modern Hebrew. (4)
spring
Reading, writing, speaking, and understanding of basic modern Hebrew, with emphasis on pronunciation and grammar. 4 hours lecture, 1 hour lab. Fee. Prerequisite: HEB 101 (or its equivalent).

HEB 201 Intermediate Modern Hebrew. (4)
fall
Intensive review of grammar, with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: HEB 102 (or its equivalent). General Studies: G

HEB 202 Intermediate Modern Hebrew. (4)
spring
Intensive review of grammar, with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: HEB 201 (or its equivalent). General Studies: G

HEB 313 Advanced Modern Hebrew. (4)
fall
Continued development of ability to communicate orally and in writing. Reading of selected literary works. Prerequisite: HEB 202 (or its equivalent).

HEB 314 Advanced Modern Hebrew. (4)
spring
Continued development of ability to communicate orally and in writing. Reading of selected literary works. Prerequisite: HEB 313 (or its equivalent).

HEB 375 Contemporary Culture of Israel. (3)
fall and spring
Intense study of aspects of historical, social, political, and cultural modern life in Israel. Beginning of Zionism to present day. Lecture, discussion. General Studies: HU, G

INDONESIAN (IDN)

IDN 101 Elementary Indonesian I. (5)
fall
Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose reading. 4 hours lecture, 1 hour lab. Fee.

IDN 102 Elementary Indonesian II. (5)
spring
Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose reading. 4 hours lecture, 1 hour lab. Fee. Prerequisite: IDN 101 (or its equivalent).

IDN 201 Intermediate Indonesian I. (5)
fall
Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: IDN 102 (or its equivalent). General Studies: G

IDN 202 Intermediate Indonesian II. (5)
spring
Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: IDN 201 (or its equivalent). General Studies: G

ITALIAN (ITA)

ITA 101 Elementary Italian. (5)
fall and spring
Aural/oral drill in class and laboratory. Basic grammar supplemented by simple prose readings. 5 hours lecture, 1 hour lab. Fee.

ITA 102 Elementary Italian. (5)
fall and spring
Aural/oral drill in class and laboratory. Basic grammar supplemented by simple prose readings. 5 hours lecture, 1 hour lab. Fee. Prerequisite: ITA 101 (or its equivalent).

ITA 201 Intermediate Italian. (3)
fall and spring
Systematic review of grammar. Development of vocabulary through reading, listening, speaking, and writing. 3 hours lecture, 1 hour lab. Fee. Prerequisite: ITA 102 (or its equivalent). General Studies: G

ITA 202 Intermediate Italian. (3)
fall and spring
Systematic review of grammar. Development of vocabulary through reading, listening, speaking, and writing. 3 hours lecture, 1 hour lab. Fee. Prerequisite: ITA 201 (or its equivalent). General Studies: G

ITA 311 Italian Composition and Conversation. (3)
fall and spring
Development of writing ability and oral expression. Prerequisite: ITA 202 (or its equivalent). General Studies: G

ITA 312 Italian Composition and Conversation. (3)
fall and spring
See ITA 311. Prerequisite: ITA 202 (or its equivalent). General Studies: G

ITA 314 Advanced Italian. (3)
not regularly offered
Advanced grammar and composition with readings of selected literary works. Prerequisite: ITA 202 or instructor approval. General Studies: G

ITA 325 Introduction to Italian Literature. (3)
fall
Italian literature through the interpretation of representative works in drama, poetry, and novel. Prerequisite: ITA 202 or instructor approval. General Studies: HU

ITA 394 Special Topics. (1–4)
not regularly offered

ITA 415 Italian Civilization. (3)
not regularly offered
General survey of history, literature, art, and music, emphasizing Italy’s cultural contribution to Western civilization. Prerequisites: ITA 311, 312 (or 314). General Studies: L/HU, G

ITA 420 Italian Cinema. (3)
fall
Major trends of Italian cinema from the post-war period to the present. General Studies: HU

ITA 425 Italian American Culture. (3)
spring
Analyzes representations of Italian American history and culture in several media including literature, film, and television. Lecture, discussion.

ITA 430 Italian Literature of the Middle Ages. (3)
not regularly offered
Emphasis on “Stil Novo,” Dante’s minor works, Petrarch, and Boccaccio. Prerequisite: ITA 325 or instructor approval. General Studies: HU

ITA 441 Dante: Divina Commedia. (3)
not regularly offered
Critical reading of the three Cantiche (Inferno, Purgatorio, and Paradiso). Prerequisite: ITA 325. General Studies: L/HU

ITA 443 Italian Literature of the Renaissance. (3)
not regularly offered
Emphasis on Lorenzo de Medici, Poliziano Castiglione, Machiavelli, Ariosto, and Tasso. Prerequisite: ITA 325 or instructor approval. General Studies: HU, H

ITA 446 Italian Literature of the 18th and 19th Centuries. (3)
not regularly offered
Goldoni, Patroni, Alferi, the poetry of Foscolo and Leopardi, and the sociohistorical novels of Foscolo, Manzoni, and Verga. Prerequisite: ITA 325 or instructor approval. General Studies: HU
JAPANESE (JPN)

JPN 101 Elementary Japanese. (5)

- Communication skills and basic skills in grammar, reading, and writing, including hiragana, katakana, and about 75 kanji. 5 hours per week. Fee.

JPN 102 Elementary Japanese. (5)

- Continuation of JPN 101. Additional 99 kanji. Continued development of communication skills in speaking, listening, reading, writing, and culture. Fee. Prerequisite: JPN 101 (or its equivalent).

JPN 107 Japanese for International Professions I. (10)

- Accelerated program alternative to JPN 101, 102 sequence. Functional approach to needs of international professions. 10 hours per week. Fee.

JPN 201 Intermediate Japanese. (5)

- 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 hours per week. Fee. Prerequisite: JPN 102 (or its equivalent).

JPN 202 Intermediate Japanese. (5)

- Continuation of JPN 201. Fee. Prerequisite: JPN 201 (or its equivalent).

JPN 206 Calligraphy. (1)

- 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.

JPN 207 Japanese for International Professions II. (10)

- Continuation of JPN 107, alternative to JPN 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. 10 hours per week. Fee. Prerequisite: JPN 107 or instructor approval.

JPN 309 Intermediate Japanese Conversation. (2)

- 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.

JPN 310 Intermediate Japanese Conversation. (2)

- Continuation of JPN 309. Prerequisite: JPN 309.

JPN 311 Japanese Conversation and Composition. (3)


JPN 312 Japanese Conversation and Composition. (3)

- See JPN 311. Prerequisite: JPN 202.

JPN 313 Advanced Japanese. (3)

- Continued development of ability to communicate orally and in writing. Exposure to the variety of Japanese written styles. Prerequisite: JPN 202 (or its equivalent).

JPN 314 Advanced Japanese. (3)

- See JPN 313. Prerequisite: JPN 313 or instructor approval.

JPN 394 Special Topics. (1–4)

- Possible topics:
  - (a) Italian/American Culture. (3)

JPN 414 Introduction to Classical Japanese. (3)

- Readings from various genres of pre-20th-century literature, with analysis of the structure of the classical language. Prerequisite: JPN 313 or instructor approval.

JPN 435 Advanced Readings. (3)

- 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.

JPN 485 Problems of Translation. (3)

- Theories and practice of translation: strategies for handling a variety of Japanese texts. Lecture, discussion. Prerequisite: JPN 314 (or its equivalent).

JPN 494 Special Topics. (1–4)

- Possible topics:
  - (a) Italian/American Culture. (3)

JPN 500 Bibliography and Research Methods. (3)

- Introduction to research materials on Japan both in Japanese and in Western languages. Overview of research methods. Lecture, discussion.

JPN 514 Advanced Premodern Japanese. (3)

- Close readings of selected premodern texts, with focus on grammatical and stylistic features. Lecture, discussion. Prerequisite: JPN 414 (or its equivalent).

JPN 520 Teaching of Japanese as a Second Language. (3)

- Theory and practice of teaching Japanese, including presentation, interaction, and evaluation, with consideration given to cultural factors. Lecture, discussion.

JPN 535 Advanced Readings. (3)

- Readings in primary and secondary sources in history, art, religious studies, literature, or other fields. Lecture, discussion. Prerequisite: JPN 414 (or its equivalent).

JPN 543 Japanese Language and Linguistics. (3)

- Analysis and discussion of linguistic theories applied to Japanese phonology, morphology, and syntax, including psychological, sociological, and historical aspects.

JPN 585 Advanced Problems of Translation. (3)

- Theories and practice of translation: strategies for handling a variety of Japanese texts. Lecture, discussion. Prerequisite: JPN 435 (or its equivalent).

JPN 591 Seminar. (3)

- Topics in literary, linguistic, or cultural studies.

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KOREAN (KOR)
KOR 101 Elementary Korean I. (5)
fall
Pronunciation, grammar, elementary conversation, and development of basic reading and writing skills including Han’gul. Lecture, recitation.
KOR 102 Elementary Korean II. (5)
spring
Continuation of KOR 101. Lecture, recitation. Prerequisite: KOR 101 (or its equivalent).
KOR 201 Intermediate Korean I. (5)
fall
Continual development of communication skills. Increased emphasis on reading and writing, vocabulary building, and review of fundamentals. Lecture, recitation. Prerequisite: KOR 102 (or its equivalent).
General Studies: G
KOR 202 Intermediate Korean II. (5)
spring
Continuation of KOR 201. Lecture, recitation. Prerequisite: KOR 201 (or its equivalent).
General Studies: G
KOR 250 Korean Culture and Society. (3)
once a year
Survey of Korean culture and society, covering history, religious traditions, gender, and popular culture. Lecture, discussion.

LATIN (LAT)
LAT 101 Elementary Latin. (4)
fall and spring
Basic Latin grammar with an emphasis on developing reading skills. For beginning students only.
LAT 102 Elementary Latin. (4)
fall and spring
Continuation of LAT 101. Prerequisite: LAT 101 (or its equivalent).
LAT 201 Intermediate Latin. (4)
fall
Selected Latin literature, both classical and postclassical: Virgil’s Aeneid; advanced grammar. Prerequisite: LAT 102 or instructor approval.
General Studies: HU
LAT 202 Intermediate Latin. (4)
spring
See LAT 201. Students entering LAT 202 directly from LAT 102 must complete LAT 201 to satisfy the College of Liberal Arts and Sciences second language requirement. Prerequisite: LAT 102 or instructor approval.
General Studies: HU
LAT 421 Roman Literature. (3)
fall
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.
General Studies: HU
LAT 422 Roman Literature. (3)
spring
See LAT 421. Prerequisite: LAT 202 or instructor approval.
General Studies: HU

NORWEGIAN (NOR)
NOR 101 Elementary Norwegian. (4)
fall
Reading, writing, speaking and understanding of basic Norwegian. 4 hours lecture, 1 hour lab. Fee.
NOR 102 Elementary Norwegian. (4)
spring
Reading, writing, speaking and understanding of basic Norwegian. 4 hours lecture, 1 hour lab. Fee. Prerequisite: NOR 101 (or its equivalent).
NOR 201 Intermediate Norwegian. (4)
fall
Review of Norwegian grammar with emphasis on the development of the skills of speaking, listening comprehension, reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: NOR 102 (or its equivalent).
NOR 202 Intermediate Norwegian. (4)
spring
Review of Norwegian grammar with emphasis on the development of the skills of speaking, listening comprehension, reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: NOR 201 (or its equivalent).

PORTUGUESE (POR)
POR 101 Elementary Portuguese. (5)
fall
Basic grammar with intensive drills in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab. Fee. Prerequisite: 1 year of Spanish or French or Italian or instructor approval.
POR 201 Intermediate Portuguese. (5)
spring
Continuation of POR 101. Intensive drill of fundamentals in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab. Fee. Prerequisite: POR 101 or instructor approval.
General Studies: G
POR 313 Portuguese Composition and Conversation. (3)
fall
Develops skill in written Portuguese and correct oral expression. Must be taken in sequence. Prerequisite: POR 201 or instructor approval.
General Studies: G
POR 314 Portuguese Composition and Conversation. (3)
spring
Continuation of POR 313. Prerequisite: POR 313 or instructor approval.
General Studies: G
POR 321 Luso-Brazilian Literature. (3)
not regularly offered
Representative masterpieces of Portuguese and Brazilian literature from the beginning to the present. Prerequisite: POR 313 or instructor approval.
General Studies: HU
POR 472 Luso-Brazilian Civilization. (3)
not regularly offered
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.
General Studies: HU, G

ROMANIAN (ROM)
ROM 101 Elementary Romanian. (5)
fall
Basic grammar with intensive drills in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab.
ROM 201 Intermediate Romanian. (5)
fall
Continuation of ROM 101. Intensive drill of fundamentals in class and laboratory directed toward conversational fluency. 5 hours lecture, 1 hour lab. Prerequisite: ROM 101 or instructor approval.
ROM 313 Romanian Composition and Conversation. (3)
spring
Develops skills in written Romanian and correct oral expression. Must be taken in sequence with ROM 314. Prerequisite: ROM 201 or instructor approval.
ROM 314 Romanian Composition and Conversation. (3)
spring
Continuation of ROM 313. Develops skills in written Romanian and correct oral expression. Must be taken in sequence. Prerequisite: ROM 313 or instructor approval.
ROM 494 Special Topics. (1–4)
once a year

RUSSIAN (RUS)
RUS 101 Elementary Russian. (4)
fall, spring, summer
Structural grammar and basic vocabulary. Introduction and reinforcement of aural/oral reading and writing skills. 4 hours lecture, 1 hour lab. Fee.
RUS 102 Elementary Russian. (4)
spring and summer
See RUS 101. Fee. Prerequisite: RUS 101 (or its equivalent).

RUS 201 Intermediate Russian. (4)
fall and summer
Systematic review of grammar. Development of vocabulary through reading and writing. Drill in aural/oral skills. 4 hours lecture, 1 hour lab. Fee. Prerequisite: RUS 102 (or its equivalent).
General Studies: G

RUS 202 Intermediate Russian. (4)
spring and summer
See RUS 201. Fee. Prerequisite: RUS 201 (or its equivalent).
General Studies: G

RUS 211 Basic Russian Conversation. (3)
fall
Intensive aural/oral drill to supplement reading and grammatical skills acquired in RUS 101, 102, 201, and 202. Required of Russian majors. Fee. Prerequisite: RUS 102.
General Studies: G

RUS 212 Basic Russian Conversation. (3)
spring
See RUS 211. Fee. Prerequisite: RUS 102.
General Studies: G

RUS 303 Scientific Russian. (3)
fall
Acquisition of scientific vocabulary through reading from current Russian scientific publications. Does not satisfy the Liberal Arts and Sciences language requirement for B.A. degree. Prerequisite: RUS 102.

RUS 304 Scientific Russian. (3)
spring
See RUS 303. Prerequisite: RUS 102.

RUS 311 Russian Composition and Conversation. (3)
fall
Develops writing ability and oral expression. Prerequisite: RUS 202.
General Studies: G

RUS 312 Russian Composition and Conversation. (3)
spring
See RUS 311. Prerequisite: RUS 202.
General Studies: G

RUS 321 Survey of Russian Literature. (3)
once a year
Main literary movements, authors, and significant works of prose, poetry, and drama from the beginning to the mid-19th century in translation. Prerequisite: RUS 202 (or its equivalent).
General Studies: L/HU, H

RUS 322 Survey of Russian Literature. (3)
once a year
Insight into the 19th- and early 20th-century Russian thought, life, and culture by reading translations of works of major writers. Prerequisite: RUS 202 (or its equivalent).
General Studies: L/HU

RUS 323 Survey of Literature of the Soviet Era. (3)
once a year
Main literary movements, prominent authors, and the most significant works of prose, poetry, and drama of the Soviet period from 1917–1991. Prerequisite: RUS 202 (or its equivalent).
General Studies: L/HU, G

RUS 411 Advanced Composition and Conversation I. (3)
fall
Improves aural discrimination and self-expression in oral and written skills, emphasizing vocabulary building. Subject materials drawn from current post-Soviet Russian publications. Prerequisite: RUS 312.
General Studies: G

RUS 412 Advanced Composition and Conversation II. (3)
spring
See RUS 411. Prerequisite: RUS 312.
General Studies: G

RUS 417 Applied Russian Phonetics. (2)
not regularly offered
General improvement in the student’s language skills through aural/oral training in Russian phonology and an analysis of Russian orthography. Prerequisite: RUS 102.

RUS 420 Russian Poetry. (3)
not regularly offered
Development of Russian poetry from its beginnings to the present, including both native and émigré poets. Topics in criticism and the study of poetics. Prerequisite: RUS 312 or instructor approval.
General Studies: L/HU

RUS 421 Pushkin. (3)
not regularly offered
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.
General Studies: L/HU

RUS 423 Dostojevskij. (3)
not regularly offered
Dostojevskij’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.
General Studies: L/HU

RUS 424 Tolstoy. (3)
not regularly offered
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.
General Studies: L/HU

RUS 425 Chekhov. (3)
not regularly offered
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.
General Studies: L/HU

RUS 426 Literatures of the Nationalities of the Former Soviet Union. (3)
not regularly offered
Includes such authors as Belsevica, Kross, Venclova, Kupala, Khvylov, Sevak, Nasi, Almatov, Charents, Cholpan. Prerequisite: RUS 312 or instructor approval.
General Studies: L/HU, G

RUS 430 Russian Short Story. (3)
not regularly offered
Detailed study of representative works of the Russian short story genre. Includes authors from both Imperial and Soviet Russia. Prerequisite: RUS 312 or instructor approval.
General Studies: L/HU

RUS 440 History of the Russian Language. (3)
not regularly offered
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.

RUS 441 Survey of Russian Culture. (3)
not regularly offered
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.
General Studies: L/HU, G, H

RUS 494 Special Topics. (1–4)
not regularly offered

RUS 499 Individualized Instruction. (1–3)
not regularly offered
SPA 101 Elementary Spanish. (4)
fall, spring, summer
Fundamentals of the language. Emphasis on listening, speaking, reading, and writing. Credit is allowed for only SPA 101 or 111. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1.

SPA 102 Elementary Spanish. (4)
fall, spring, summer
See SPA 101. Credit is allowed for only SPA 102 or 111. Fee. See SPA Note 1. Prerequisite: SPA 101 (or its equivalent).

SPA 107 Spanish for International Professions I. (8)
fall
Accelerated program alternative to SPA 101, 102 sequence. Functional approach to needs of international professions. Fee. See SPA Note 1.

SPA 111 Fundamentals of Spanish. (4)
fall and spring
Primarily for students with two years of high school Spanish who need review to enter second-year study. Credit is allowed for only SPA 111 or both SPA 101 and 102. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1.

SPA 201 Intermediate Spanish. (4)
fall, spring, summer
Continuation of fundamentals. Emphasis on the development of the skills of reading, listening comprehension, speaking, writing, and culture. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1. Prerequisite: SPA 102 or 111.
General Studies: G

SPA 202 Intermediate Spanish. (4)
fall, spring, summer
See SPA 201. Fee. See SPA Note 1. Prerequisite: SPA 201 (or its equivalent).
General Studies: G

SPA 203 Intermediate Spanish for Bilinguals. (4)
fall
For Spanish-speaking students, in lieu of SPA 201. Composition, literature, conversation, grammar fundamentals. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1. Prerequisite: SPA 102 or 111 or placement examination.
General Studies: G

SPA 204 Intermediate Spanish for Bilinguals. (4)
spring
For Spanish-speaking students, in lieu of SPA 202. Composition, literature, conversation, grammar fundamentals. 4 hours lecture, 1 hour lab. Fee. See SPA Note 1. Prerequisite: SPA 203 (or its equivalent).
General Studies: G

SPA 207 Spanish for International Professions II. (8)
spring
Continuation of SPA 107, alternative to SPA 201, 202 sequence. Expansion of communicative proficiency in specific areas of international professions. Fee. See SPA Note 1. Prerequisite: SPA 107 or instructor approval.
General Studies: G

SPA 311 Spanish Conversation. (3)
fall and spring
See SPA 311. See SPA Note 1. Prerequisite: SPA 311 (or its equivalent).

SPA 312 Spanish Conversation. (3)
fall and spring
See SPA 312. See SPA Note 1. Prerequisite: SPA 311 (or its equivalent).

SPA 313 Spanish Conversation and Composition. (3)
fall, spring, summer
Designed to develop skill and accuracy in spoken and written Spanish. Required of majors; SPA 313 and 314 must be taken in sequence. See SPA Note 1. Prerequisite: SPA 202 (or its equivalent).
General Studies: G

SPA 314 Spanish Conversation and Composition. (3)
fall, spring, summer
See SPA 313. See SPA Note 1. Prerequisite: SPA 313 (or its equivalent).

SPA 315 Spanish Conversation and Composition for Bilinguals. (3)
fall
Emphasis on comparing standard Spanish with regional Southwest Spanish. May be taken in lieu of SPA 313 and 314. See SPA Note 1. Prerequisite: SPA 202 or 204 or instructor approval.

SPA 316 Spanish Conversation and Composition for Bilinguals. (3)
spring
See SPA 315. See SPA Note 1. Prerequisite: SPA 315 (or its equivalent).

SPA 319 Business Correspondence and Communication. (3)
not regularly offered
Organization and presentation of clear, effective business communications; vocabulary applicable to modern business usage. See SPA Note 1. Prerequisite: SPA 314 or 316 or instructor approval.
General Studies: G

SPA 325 Introduction to Hispanic Literature. (3)
fall and spring
Critical approach to and analysis of literary types, including poetry, drama, short story, and novel. Required of all majors. See SPA Note 1. Prerequisite: SPA 313.
General Studies: HU
SPA 400 Introduction to Spanish Linguistics. (3)  
fall  
Introduction to the discipline and methods of linguistics through the study of Spanish data. Prerequisite: SPA 412 (or its equivalent).  

SPA 412 Advanced Conversation and Composition. (3)  
fall and spring  
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.  
General Studies: G  

SPA 413 Advanced Spanish Grammar. (3)  
fall  
Intensive analysis of the Spanish language. Required of teaching majors. Prerequisite: SPA 314 or 316 or instructor approval.  
General Studies: G  

SPA 417 Spanish Phonetics and Phonology. (3)  
fall  
Introduction to the theory and practice of Spanish phonetics and phonology. Prerequisite: SPA 412.  

SPA 420 Applied Spanish Linguistics. (3)  
spring  
Application of linguistic principles to the teaching of Spanish. Prerequisites: FLA 400 (or its equivalent); SPA 412.  
General Studies: L  

SPA 421 Spanish in the Southwest. (3)  
fall  
Discussion and linguistic analysis of Southwest Spanish. Prerequisite: SPA 412.  
General Studies: L/SB, C  

SPA 425 Spanish Literature. (3)  
fall and spring  
Survey of Spanish literature from its beginning to 1700. Prerequisite: SPA 325.  
General Studies: HU  

SPA 426 Spanish Literature. (3)  
fall and spring  
Surveys Spanish literature from 1700 to the present. Prerequisite: SPA 325.  
General Studies: HU  

SPA 427 Spanish American Literature. (3)  
fall and spring  
Surveys major works, figures, and movements from Colonial period to 1880. Prerequisite: SPA 325.  
General Studies: L  

SPA 428 Spanish American Literature. (3)  
fall and spring  
Surveys major works, figures, and movements from 1880 to the present. Prerequisite: SPA 325.  
General Studies: L, G  

SPA 429 Mexican Literature. (3)  
not regularly offered  
Selected readings from pre-Columbian writers/poets (e.g., Macuilxochitl) through the novel of the Revolution to the present. Prerequisite: SPA 325.  

SPA 434 Drama of the Golden Age. (3)  
spring  
Dramatic works of Lope de Vega, Calderón de la Barca, and their contemporaries. Prerequisite: SPA 325.  

SPA 435 Cervantes—Don Quijote. (3)  
fall  
Don Quijote and the development of the novel. Prerequisite: SPA 325.  

SPA 454 19th-Century Spanish American Narrative. (3)  
fall  
Principal works in the novel, short story, narrative fiction, and narrative (Gaucho) poetry. Prerequisite: SPA 325.  

SPA 456 20th-Century Spanish American Fiction. (3)  
spring  
Major works and movements. Prerequisite: SPA 325.  

SPA 464 Mexican American Literature. (3)  
fall  
Representative literature in Spanish and English by Mexican Americans, emphasizing sociocultural as well as literary values. Prerequisite: SPA 325.  
General Studies: HU  

SPA 471 Civilization of the Spanish Southwest. (3)  
spring  
Political, intellectual, social, economic, and artistic development of the Spanish-speaking people of the Southwest. Prerequisite: SPA 314 or 316 or instructor approval.  
General Studies: HU  

SPA 472 Spanish American Civilization. (3)  
fall  
Growth of the institutions and cultures of Spanish American people. Prerequisite: SPA 314 or 316 or instructor approval.  
General Studies: HU, G, H  

SPA 473 Spanish Civilization. (3)  
spring  
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.  
General Studies: HU/SB, G  

SPA 485 Mexican American Short Story. (3)  
not regularly offered  
Critical study of contemporary short stories by Mexican American authors, with emphasis on their Spanish-language writings. Prerequisite: SPA 325 or instructor approval.  

SPA 486 Mexican American Novel. (3)  
not regularly offered  
Social and literary contexts of representative novelists, emphasizing their Spanish-language writings. Prerequisite: SPA 325 or instructor approval.  

SPA 487 Mexican American Drama. (3)  
not regularly offered  
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.  

SPA 494 Special Topics. (1–4)  
not regularly offered  
Possible topics:  
(a) Introduction to Hispanic Linguistics. (3)  
(b) Lexicography. (3)  

SPA 500 Bibliography and Research Methods. (3)  
fall  
Required of all graduate students.  

SPA 536 Generation of 1898. (3)  
not regularly offered  
Works of Unamuno, Baroja, Azorín, and their contemporaries, studied against the ideological background of the turn of century in Spain. Prerequisite: SPA 325.  

SPA 540 History of the Spanish Language. (3)  
spring  
Analyzes and discusses the development of Spanish from Vulgar Latin to the present day. Prerequisite: FLA 400 (or its equivalent).  

SPA 541 Spanish Language in America. (3)  
fall  
Discusses and analyzes various regional and social varieties of Spanish in the Americas. Prerequisite: FLA 400 (or its equivalent).  

SPA 542 Studies in the Spanish of the Southwest. (3)  
spring  
Examines bilingualism and the social and regional dialects of Spanish in the Southwest. Prerequisite: FLA 400 (or its equivalent).  

SPA 543 Structure of Spanish. (3)  
spring  
Analyzes and discusses data on selected topics in Spanish morphology, semantics, and syntax. Prerequisite: FLA 400 (or its equivalent).  

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
SPA 544 Spanish Phonology. (3)  
Spring  
Surveys problems of Spanish phonology within the context of recent phonological theory. Prerequisite: FLA 400 (or its equivalent).

SPA 545 Concepts of Literary Criticism. (3)  
Spring  
Aims and methods of modern literary scholarship. Discusses major theories of literary analysis.

SPA 555 Spanish American Modernism. (3)  
Not regularly offered  
Principal works and figures of literary modernism, 1880–1920, with emphasis on international literary context of the movement. Prerequisite: SPA 325.

SPA 557 Contemporary Spanish American Poetry. (3)  
Not regularly offered  
Major works and problems in contemporary poetry and poetics, with emphasis on Paz, Farra, Cardenal, and new poetry since 1960. Prerequisite: SPA 325.

SPA 560 Medieval Spanish Literature. (3)  
Not regularly offered  
Major figures and works of the Middle Ages in Spain.

SPA 561 Golden Age Spanish Prose Fiction. (3)  
Not regularly offered  
Major figures and works of the 16th and 17th centuries, with emphasis on the picaresque novel.

SPA 562 Golden Age Spanish Poetry. (3)  
Not regularly offered  
Major figures and works of the 16th and 17th centuries, with emphasis on lyric poetry.

SPA 563 Spanish Romanticism. (3)  
Not regularly offered  
Principal figures and works of the Spanish romanticism, with emphasis on international literary context of the movement.

SPA 564 19th-Century Spanish Prose Fiction. (3)  
Not regularly offered  
Principal figures and works of realism in the 19th-century novel, with emphasis on Galdós.

SPA 565 20th-Century Spanish Drama. (3)  
Not regularly offered  
Principal figures and works of Spanish dramatic literature from the Generation of 1898 to the present.

SPA 566 Generation of 1927. (3)  
Not regularly offered  
Major poets of the Generation of 1927, with emphasis on works of Lorca, Guillén, Salinas, and Aleixandre.

SPA 567 Contemporary Spanish Novel. (3)  
Not regularly offered  
Major works of post-Civil War Spanish fiction.

SPA 568 Cervantes. (3)  
Not regularly offered  
Extensive analysis of the prose and theater of Cervantes as a key figure of the Spanish Golden Age. Lecture; seminar.

SPA 570 Indigenous Literatures of Spanish America. (3)  
Not regularly offered  
Indigenous literary traditions, with emphasis on Nahuatl, Mayan, and Quechua literatures through readings in Spanish translations.

SPA 571 Colonial Spanish American Literature. (3)  
Not regularly offered  
Major figures and works from conquest to independence.

SPA 572 Spanish American Drama. (3)  
Not regularly offered  
Major contributions of Spanish American drama, with emphasis on contemporary dramatists.

SPA 573 Spanish American Essay. (3)  
Not regularly offered  
Major works of the essay, within the framework of intellectual history and literary movements.

SPA 574 Spanish American Vanguard Poetry. (3)  
Not regularly offered  
Examines poetic developments, 1920–1940, with emphasis on Huidobro, Vallejo, Neruda, and the international context of their works.

SPA 575 Contemporary Spanish American Novel. (3)  
Not regularly offered  
Principal novels of the Nueva Narrativa Hispanoamericana, within the context of contemporary theories of the narrative.

SPA 576 Contemporary Spanish American Short Story. (3)  
Not regularly offered  
Principal short stories of the Nueva Narrativa Hispanoamericana, within the context of contemporary theories of the narrative.

SPA 577 Regional Spanish American Literature. (3)  
Not regularly offered  
Figures and works of major national (Peru, Argentina, Chile, and Mexico) and regional (Caribbean) literatures. Topics offered on a rotating basis. May be repeated when topics vary.

SPA 578 Novel of the Mexican Revolution. (3)  
Not regularly offered  
Representative works and authors of this genre (Guzmán, Azuela, Uruquio, Muñoz, and Romero), including related or peripheral offshoots in indigenous novels.

SPA 581 Latin American Popular Culture. (3)  
Not regularly offered  
Studies in selected topics of Latin American popular culture, with emphasis on appropriate academic models for the critical analysis of these materials.

SPA 582 Studies in Latin American Film. (3)  
Not regularly offered  
Examines the role of film in contemporary Latin American culture; films viewed and analyzed as casebook examples. Seminar.

SPA 591 Seminar. (3)  
Not regularly offered  
Spanish and Spanish American literary, cultural, and linguistic topics.

SPA 691 Figures and Works Seminar. (3)  
Not regularly offered  
Topics may be selected from Spanish and Spanish American literatures.

**SWEDISH (SWE)**

SWE 101 Elementary Swedish. (4)  
Fall  
Reading, writing, speaking, and understanding of basic Swedish. 4 hours lecture, 1 hour lab. Fee.

SWE 102 Elementary Swedish. (4)  
Spring  
Reading, writing, speaking, and understanding of basic Swedish. 4 hours lecture, 1 hour lab. Fee. Prerequisite: SWE 101 (or its equivalent).

SWE 201 Intermediate Swedish. (4)  
Fall  
Reviews Swedish grammar with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: SWE 102 (or its equivalent).

SWE 202 Intermediate Swedish. (4)  
Spring  
Reviews Swedish grammar with emphasis on the development of the skills of speaking, listening comprehension, reading, and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: SWE 201 (or its equivalent).

**THAI (THA)**

THA 101 Elementary Thai I. (5)  
Fall  
Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose readings in Thai script. 4 hours lecture, 1 hour lab. Fee.

THA 102 Elementary Thai II. (5)  
Spring  
Basic communication, reading, and writing skills. Intensive oral/aural classroom drill supplemented by prose reading. 4 hours lecture, 1 hour lab. Fee. Prerequisite: THA 101 (or its equivalent).

THA 201 Intermediate Thai I. (5)  
Fall  
Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: THA 102 (or its equivalent).  
General Studies: G
THA 202 Intermediate Thai II. (5)

Spring
Systematic review of grammar. Continued development of communication skills with increased emphasis on reading and writing. 4 hours lecture, 1 hour lab. Fee. Prerequisite: THA 201 (or its equivalent).

General Studies: G

VIETNAMESE (VTN)

VTN 101 Elementary Vietnamese I. (5)

Fall
Basic skills in modern conversational Vietnamese and development of basic reading and writing skills, with special emphasis on tones. 4 hours lecture, 1 hour lab. Prerequisite: VTN 101 (or its equivalent).

VTN 201 Intermediate Vietnamese I. (5)

Fall
Improves students' speaking, listening, reading, and writing competence through dialogues, reading passages, pattern drill, and grammar and communicative exercises. 4 hours lecture, 1 hour lab. Prerequisite: VTN 102 (or its equivalent).

General Studies: G

VTN 202 Intermediate Vietnamese II. (5)

Spring
Improves students' speaking, listening, reading, and writing competence through dialogues, reading passages, pattern drill, and grammar and communicative exercises. 4 hours lecture, 1 hour lab. Prerequisite: VTN 201 (or its equivalent).

General Studies: G

Department of Mathematics

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Chair

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REGENTS' PROFESSOR

TROTTER

PROFESSORS

ARMBRUSTER, BREMNER, BUSTOZ, GARDNER, HOPPENSTEADT, IHRIG, Z. JACKIEWICZ, KADELL, KAWSKI, KIERSTEAD, KOSTELICH, KUANG, KUIPER, LEONARD, LOHR, Mc DONALD, MITTELMANN, NICOLAENKO, QUIGG, RENAU T, RINGHOFER, H.A. SMITH, H.L. SMITH, THIEME, WEISS, YOUNG

ASSOCIATE PROFESSORS

BAER, BARCEO L, BLOUNT, CARLSON, CHILDRESS, DRISCOLL, FAN, FARMER, HURLBERT, J. JONES, KURTZ, LAI, LOPEZ, MAHALOV, McCARTER, MOORE, PREWITT, SPIELBERG, SWIMMER, TAYLOR, J. TURNER, WELFERT

ASSISTANT PROFESSORS

CZYGRINOW, GELB, D. JONES, KALISZEWSKI, NIKITIN, G. SMITH, SUNSOV, ZANDIEH, ZUO

SENIOR LECTURERS

ISOM, KOLOSSA, RODY, SCHINELLER, VAZ, A. ZHU

LECTURERS

ABRAMSON, BLOOM, DOWNS, E. JACKIEWICZ, E. JONES, MARIS, MARTIN, MILLER, ODISH, RUEDEMANN, SIEBEN, SURGENT, TRACOGNA, TRAPUZZANO, T. TURNER, WALKER, WARD, Y. ZHU

The Department of Mathematics offers the B.A. and B.S. degrees in Mathematics. Students who plan to attend graduate school in mathematics or statistics should choose the B.S. degree. The B.S. degree in Mathematics is available with a concentration in computational mathematical sciences; however, the requirements for the degree with the concentration are distinct from the requirements for the degree without the concentration.

The department also offers a minor in Mathematics and an academic specialization in mathematics for students pursuing the B.A.E. degree in Secondary Education.

Related Field Course List. All students majoring in Mathematics need to refer to the related field course list. It is available from an advisor in PS A211, or from the department Web site at math.la.asu.edu/~undergrad/underprog/degree/related-fields.html.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
MATHEMATICS—B.A.

The B.A. degree in Mathematics requires a minimum of 36 semester hours of course work in mathematics and statistics, and additional course work in closely related fields, for a total of 51 semester hours. A grade of ‘‘C’’ or higher is required in all courses taken for the major. MAT 370 and 371 may not be used to satisfy these degree requirements. The required course work has the following components:

Core Courses
MAT 270 Calculus with Analytic Geometry I MA .................. 4
MAT 271 Calculus with Analytic Geometry II MA .................. 4
MAT 272 Calculus with Analytic Geometry III MA ............... 4
MAT 300 Mathematical Structures L ...................................... 3
MAT 342 Linear Algebra .................................................... 3
MAT 370 Intermediate Calculus ............................................ 3
   or MAT 371 Advanced Calculus I (3)
Total .................................................................................. 21

Computer Science Requirement
CSE 100 Principles of Programming with C++ CS ............... 3
   or CSE 200 Concepts of Computer Science CS (3)
Total .................................................................................. 3

Advanced Courses in Mathematics and Statistics
Two courses from the following list, both preferably taken from the same grouping.................................................. 6
Algebra, Topology, and Number Theory
MAT 410 Introduction to General Topology (3)
MAT 442 Advanced Linear Algebra (3)
MAT 443 Introduction to Abstract Algebra (3)
MAT 444 Intermediate Abstract Algebra (3)
MAT 445 Theory of Numbers (3)
Analysis and Applications
MAT 372 Advanced Calculus II (3)
MAT 461 Applied Complex Analysis (3)
MAT 472 Intermediate Real Analysis (3)
Applied Mathematics and Dynamics
MAT 451 Mathematical Modeling CS (3)
MAT 452 Introduction to Chaos and Nonlinear Dynamics (3)
MAT 455 Introduction to Fractals and Applications (3)
Computational Mathematics
MAT 420 Scientific Computing (3)
MAT 421 Applied Computational Methods CS (3)
MAT 423 Numerical Analysis I CS (3)
MAT 425 Numerical Analysis II CS (3)
MAT 427 Computer Arithmetic CS (3)
Differential Equations
MAT 462 Applied Partial Differential Equations (3)
MAT 475 Differential Equations (3)
MAT 476 Partial Differential Equations (3)
Discrete Mathematics
MAT 415 Introduction to Combinatorics (3)
MAT 416 Introduction to Graph Theory (3)
MAT 419 Introduction to Linear Programming CS (3)
Statistics and Probability
STP 420 Introductory Applied Statistics CS (3)
STP 421 Probability (3)
STP 425 Stochastic Processes (3)
STP 427 Mathematical Statistics (3)
STP 429 Experimental Statistics CS (3)
Additional Course Work in Mathematics and Statistics
Three courses in mathematics and statistics......................... 9

Related Field Course Work
Twelve hours of course work in mathematics, statistics,
or related fields ................................................................. 12

1 Acceptable mathematics courses are MAT 274 and upper-division MAT courses, with the exception of MAT 362, 485, and ASU West MAT 411. Acceptable statistics courses are upper-division STP courses.
2 See “Related Field Course List,” page 401.

MATHEMATICS—B.S.

The Department of Mathematics has two avenues for earning a B.S. degree. The B.S. requirements are similar to the B.A. requirements, but they require more extensive course work in advanced mathematics. The program is flexible enough to allow students to focus their studies on mathematics, applied mathematics, or statistics. The computational mathematical sciences concentration is an interdisciplinary program with significant components of computer science, physical and biological sciences, and mathematics and statistics. The requirements for the B.S. degree and for the B.S. degree with the computational mathematical sciences concentration are distinct; neither is a subset of the other.

B.S. Requirements. The B.S. degree in Mathematics requires a minimum of 42 semester hours of course work in mathematics and statistics, and additional course work in closely related fields, for a total of 55 semester hours. A grade of ‘‘C’’ or higher is required in all courses taken for the major. MAT 370 and 371 may not both be used to satisfy these degree requirements. The required course work has the following components:

Core Courses
MAT 270 Calculus with Analytic Geometry I MA .................. 4
MAT 271 Calculus with Analytic Geometry II MA .................. 4
MAT 272 Calculus with Analytic Geometry III MA ............... 4
MAT 300 Mathematical Structures L ...................................... 3
MAT 342 Linear Algebra .................................................... 3
MAT 371 Advanced Calculus I ............................................ 3
Total .................................................................................. 21

Computer Science Requirement
CSE 200 Concepts of Computer Science CS (3)
Total .................................................................................. 3

Depth Requirement
Two courses chosen from the following list of advanced courses................................................................. 6
MAT 423 Numerical Analysis I CS (3)
MAT 425 Numerical Analysis II CS (3)
MAT 442 Advanced Linear Algebra (3)
MAT 444 Intermediate Abstract Algebra (3)
MAT 462 Applied Partial Differential Equations (3)
MAT 472 Intermediate Real Analysis (3)
MAT 475 Differential Equations (3)
MAT 476 Partial Differential Equations (3)
STP 421 Probability (3)
STP 427 Mathematical Statistics (3)

Advanced Courses in Mathematics and Statistics
Two courses from the following list, both preferably taken from the same grouping............................................. 6
Algebra, Topology, and Number Theory
MAT 410 Introduction to General Topology (3)
MAT 442 Advanced Linear Algebra (3)
MAT 443 Introduction to Abstract Algebra (3)
MAT 444 Intermediate Abstract Algebra (3)
MAT 445 Theory of Numbers (3)

Analysis and Applications
MAT 372 Advanced Calculus II (3)
MAT 461 Applied Complex Analysis (3)
MAT 472 Intermediate Real Analysis (3)

Applied Mathematics and Dynamics
MAT 451 Mathematical Modeling CS (3)
MAT 452 Introduction to Chaos and Nonlinear Dynamics (3)
MAT 455 Introduction to Fractals and Applications (3)

Computational Mathematics
MAT 420 Scientific Computing (3)
MAT 421 Applied Computational Methods CS (3)
MAT 423 Numerical Analysis I CS (3)
MAT 425 Numerical Analysis II CS (3)
MAT 427 Computer Arithmetic CS (3)

Differential Equations
MAT 462 Applied Partial Differential Equations (3)
MAT 475 Differential Equations (3)
MAT 476 Partial Differential Equations (3)

Discrete Mathematics
MAT 415 Introduction to Combinatorics (3)
MAT 416 Introduction to Graph Theory (3)
MAT 419 Introduction to Linear Programming CS (3)

Statistics and Probability
STP 420 Introductory Applied Statistics CS (3)
STP 421 Probability (3)
STP 425 Stochastic Processes (3)
STP 427 Mathematical Statistics (3)
STP 429 Experimental Statistics CS (3)

Additional Course Work in Mathematics and Statistics
Three courses in mathematics and statistics .................................9

Related Fields Course Work
Ten hours of course work in mathematics, statistics,
or related fields is required ......................................................10

1 Students who contemplate graduate work in mathematics should choose additional courses listed under the depth requirement to satisfy the advanced courses requirement.
2 Acceptable mathematics courses are MAT 274 and upper division MAT courses, with the exception of MAT 310, 362, 485, and ASU West MAT 411. Acceptable statistics courses are 400-level STP courses.
3 See “Related Field Course List,” page 401.

Computational Mathematical Sciences Concentration Requirements. The B.S. degree in Mathematics with the computational mathematical sciences concentration requires a minimum of 36 semester hours of course work in mathematics and statistics, plus a minimum of 21 semester hours in physics, computer science, and other sciences for a minimum of 57 semester hours of course work related to the major. A grade of “C” or higher is required in all courses taken for the major. MAT 370 and 371 may not be used to satisfy these degree requirements. The required course work has the following components:

Core Courses
MAT 270 Calculus with Analytic Geometry I MA .......................4
MAT 271 Calculus with Analytic Geometry II MA .......................4
MAT 272 Calculus with Analytic Geometry III MA .....................4
MAT 274 Elementary Differential Equations MA .......................3
MAT 300 Mathematical Structures L .................................3
MAT 342 Linear Algebra ..................................................3

Total .........................................................................................21

Computer Science Requirement
CSE 200 Concepts of Computer Science CS .........................3
CSE 210 Object-Oriented Design and Data Structures CS ........3
CSE 310 Data Structures and Algorithms ..........................3
MAT 420 Scientific Computing ...........................................3

Total .........................................................................................12

Physics Requirement
Two semesters of introductory physics as shown ....................6 or 8
PHY 121 University Physics I: Mechanics SQ (3)*
or PHY 151 Physics II SQ (4)
PHY 131 University Physics II: Electricity and Magnetism SQ (3)*
or PHY 150 Physics I SQ (4)

* It is highly recommended that students taking PHY 121 and 131 also take the associated laboratory courses PHY 122 and 132.

Advanced Courses in Mathematics and Statistics
Choose one course from each of the following four groups........12

Group One
MAT 371 Advanced Calculus I (3)
MAT 460 Vector Calculus (3)

Group Two
MAE 471 Computational Fluid Dynamics (3)
or other course as approved by an advisor
MAT 419 Introduction to Linear Programming CS (3)
MAT 421 Applied Computational Methods CS (3)
MAT 423 Numerical Analysis I CS (3)
MAT 425 Numerical Analysis II CS (3)
STP 429 Experimental Statistics CS (3)

Group Three
MAT 372 Advanced Calculus II (3)
MAT 427 Computer Arithmetic CS (3)
MAT 451 Mathematical Modeling CS (3)
MAT 452 Introduction to Chaos and Nonlinear Dynamics (3)
MAT 461 Applied Complex Analysis (3)
MAT 462 Applied Partial Differential Equations (3)
MAT 475 Differential Equations (3)
STP 420 Introductory Applied Statistics CS (3)
STP 421 Probability (3)
One course not already chosen from Group One or Two (3)

Group Four
One course from either Group One, Two, or Three, or any other 400-level MAT or STP course except for MAT 485, and ASU West MAT 411 (3)

Second Science
Choose among the course combinations below for a one-year sequence in another science, chosen from astronomy, biology, geology, or chemistry .................................6–9
AST 321 Introduction to Planetary and Stellar Astrophysics SQ 2 (3)
AST 322 Introduction to Galactic and Extragalactic Astrophysics SQ 2 (3)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
BIO 181 General Biology SQ (4)
BIO 182 General Biology SG (4)

GLG 101 Introduction to Geology I (Physical) SQ, G (3)
GLG 102 Introduction to Geology II (Historical) SG, H (3)

Any two of CHM 113, 114, 115, 116, 117, and 118 as permitted by the Department of Chemistry and Biochemistry.

1 Other course combinations may be used upon approval of a departmental advisor.

2 Both AST 113 and 321 or both AST 114 and 322 must be taken to secure SQ credit.

3 Both GLG 101 and 103 must be taken to secure SQ credit.

4 Both GLG 102 and 104 must be taken to secure SG credit.

5 See the individual course listings for restrictions.

Advanced Science Course or Internship
One advanced course in a science for which a one-year course sequence in the same science is required, or an internship, subject to advisor approval.

MAT 484 Internship (3)
Any upper-division course in plant biology (PLB), chemistry (CHM), or microbiology (MIC) (3)
Any upper-division science or engineering course from the related field course list2 (3)

1 Other courses may be used to satisfy this requirement with the approval of a Department of Mathematics advisor.

2 Note that courses with prefixes ECN, FIN, MAT, PHI, and STP do not count toward this requirement. See “Related Field Course List,” page 401.

Statistics. Students interested in concentrating their mathematical studies on statistics should satisfy the requirements for a B.S. degree in Mathematics with the following courses. A grade of “C” or higher is required in all courses taken for the major. MAT 370 and 371 may not be used to satisfy these degree requirements.

Core Courses
MAT 270 Calculus with Analytic Geometry I MA ................. 4
MAT 271 Calculus with Analytic Geometry II MA ............... 4
MAT 272 Calculus with Analytic Geometry III MA .............. 4
MAT 300 Mathematical Structures L .................................... 3
MAT 342 Linear Algebra ................................................... 3
MAT 371 Advanced Calculus I ............................................. 3
STP 420 Introductory Applied Statistics CS ....................... 3
STP 421 Probability .......................................................... 3
STP 427 Mathematical Statistics ......................................... 3
STP 429 Experimental Statistics CS ................................. 3

Total .................................................................................. 33

Computer Science Requirement
CSE 200 Concepts of Computer Science CS ....................... 3

Total .................................................................................. 3

Additional Advanced Courses in Mathematics and Statistics
Three courses from the following list ................................. 9

MAT 274 Elementary Differential Equations MA (3)
MAT 372 Advanced Calculus II (3)
MAT 423 Numerical Analysis I CS (3)
MAT 442 Advanced Linear Algebra (3)
STP 425 Stochastic Processes (3)

Required Related Field Course Work
Statistics/probability, mathematics, or related fields* .................. 10

* See “Related Field Course List,” page 401.

Actuarial Science. The faculty in the Department of Mathematics offer courses that cover the content of the mathematical examinations of the Society of Actuaries. See the department’s actuarial advisor for more information.

MINOR IN MATHEMATICS
The minor in Mathematics consists of a minimum of 20 semester hours. Required courses are as follows:

MAT 271 Calculus with Analytic Geometry II MA ............... 4
MAT 272 Calculus with Analytic Geometry III MA .............. 4
MAT 342 Linear Algebra ................................................... 3

Total .................................................................................. 11

Electives must be upper-division courses in mathematics (MAT) or Statistics and Probability (STP). Students may not apply MAT 362, 485, or a course not offered at ASU’s main campus to the math minor, unless otherwise approved by a math department advisor.

SECONDARY EDUCATION—B.A.E.

Mathematics. Students pursuing the major teaching field may choose from two options.

Option One. With this option, the academic specialization consists of the following required courses:

CSE 100 Principles of Programming with C++ CS ................. 3
or CSE 183 Applied Problem Solving with FORTRAN CS (3)

MAT 271 Calculus with Analytic Geometry II MA ............... 4
MAT 272 Calculus with Analytic Geometry III MA .............. 4
MAT 300 Mathematical Structures L .................................... 3
MAT 310 Introduction to Geometry ...................................... 3
MAT 342 Linear Algebra ................................................... 3
MAT 370 Intermediate Calculus ......................................... 3
MAT 443 Introduction to Abstract Algebra ......................... 3
or MAT 371 Advanced Calculus I (3)
MAT 445 Theory of Numbers (3)
MTE 483 Mathematics in the Secondary School .................. 3
STP 420 Introductory Applied Statistics CS ....................... 3

Total .................................................................................. 36

The methods in academic specialization courses for mathematics are MTE 482 Methods of Teaching Mathematics in Secondary School and MTE 494 Special Topics: Advanced Methods of Teaching Secondary Mathematics. They are required as part of the Professional Teacher Preparation Program (PTPP) but cannot be counted as part of the 36-hour major requirement.

Option Two. This option may be exercised only in combination with option two under “Chemistry,” page 347, or “Physics,” page 421. The program consists of 30 semester hours in mathematics. Required courses are as follows:

MAT 270 Calculus with Analytic Geometry I MA ............... 4
MAT 271 Calculus with Analytic Geometry II MA .............. 4
MAT 272 Calculus with Analytic Geometry III MA ..........4
MAT 300 Mathematical Structures I ..................................3
MAT 310 Introduction to Geometry .....................................3
MAT 342 Linear Algebra ...................................................3
MAT 370 Intermediate Calculus MA .................................3
or MAT 371 Advanced Calculus I (3)
or MAT 460 Vector Calculus (3)
MAT 443 Introduction to Abstract Algebra .......................3

Total ..................................................................................27

Recommended
CSE 100 Principles of Programming with C++ CS ..........3
or CSE 200 Concepts of Computer Science CS (3)

Minor Teaching Field. The minor teaching field is a minor in mathematics for presecondary teachers, consisting of the following required courses:

MAT 271 Calculus with Analytic Geometry II MA ..........4
MAT 272 Calculus with Analytic Geometry III MA ..........4
MAT 300 Mathematical Structures I .................................3
MAT 310 Introduction to Geometry .....................................3
MAT 342 Linear Algebra ...................................................3
MAT 370 Intermediate Calculus MA .................................3
or MAT 371 Advanced Calculus I (3)

Total ..................................................................................20

GRADUATE PROGRAMS

The faculty in the Department of Mathematics offer programs leading to the degrees of Master of Natural Science, M.A., and Ph.D. See the Graduate Catalog for requirements.

MATHEMATICS (MAT)

MAT 106 Intermediate Algebra. (3)
fall, spring, summer
Topics from basic algebra such as linear equations, polynomials, factoring, exponents, roots, and radicals. Prerequisite: 1 year of high school algebra.

MAT 114 College Mathematics. (3)
fall, spring, summer
Applications of basic college-level mathematics to real-life problems. Appropriate for students whose major does not require MAT 117 or 170. Prerequisite: MAT 106 or 2 years of high school algebra.

MAT 117 College Algebra. (3)
fall, spring, summer
Linear and quadratic functions, systems of linear equations, logarithmic and exponential functions, sequences, series, and combinatorics. Prerequisite: MAT 106 or 2 years of high school algebra.

MAT 119 Finite Mathematics. (3)
fall, spring, summer
Topics from linear algebra, linear programming, combinatorics, probability, and mathematics of finance. Prerequisite: MAT 117 (or its equivalent).

MAT 170 Precalculus. (3)
fall, spring, summer
Intensive preparation for calculus (MAT 260, 270, and 290). Topics include functions (including trigonometric), matrices, polar coordinates, vectors, complex numbers, and mathematical induction. Prerequisite with a grade of “B” or higher: MAT 106. Prerequisite with a grade of “C” or higher: MAT 117 or two years of high school algebra.

MAT 210 Brief Calculus. (3)
fall, spring, summer
Differential and integral calculus of elementary functions with applications. Not open to students with credit for MAT 260, 270, or 290. Prerequisite: MAT 117 (or its equivalent).

MAT 242 Elementary Linear Algebra. (2)
fall, spring, summer
Introduction to matrices, systems of linear equations, determinants, vector spaces, linear transformations, and eigenvalues. Emphasizes development of computational skills. Prerequisite: 1 semester of calculus or instructor approval.

MAT 243 Discrete Mathematical Structures. (3)
fall, spring, summer
Logic, sets, functions, elementary number theory and combinatorics, recursive algorithms, and mathematical reasoning, including induction. Emphasizes connections to computer science. Prerequisite: 1 semester of calculus or computer programming.

MAT 251 Calculus for Life Sciences. (3)
fall and spring
Differential and integral calculus of elementary functions. Introduction to differential and difference equations. Emphasis on applications to the life sciences. Not open to students with credit for MAT 210, 260, or 270. Prerequisite: MAT 170 (or its equivalent).

MAT 260 Technical Calculus I. (3)
not regularly offered
Analytic geometry, differential, and integral calculus of elementary functions, emphasizing physical interpretation and problem solving. Not open to students with credit for MAT 210, 260, or 290. Prerequisite: MAT 170 (or its equivalent).

MAT 261 Technical Calculus II. (3)
not regularly offered
Continuation of MAT 260. Prerequisite: MAT 260 or instructor approval.

MAT 262 Technical Calculus III. (3)
not regularly offered
Infinite series, an introduction to differential equations and elementary linear algebra. Prerequisite: MAT 261 (or its equivalent).

MAT 270 Calculus with Analytic Geometry I. (4)
fall, spring, summer
Real numbers, limits and continuity, and differential and integral calculus of functions of 1 variable. Not open to students with credit for MAT 290. The sequence MAT 270 and 271 may be substituted for MAT 290 to satisfy requirements of any curriculum. Prerequisite with a grade of “C” or higher: MAT 170 or satisfactory score on placement examination.

MAT 271 Calculus with Analytic Geometry II. (4)
fall, spring, summer
Methods of integration, applications of calculus, elements of analytic geometry, improper integrals, sequences, and series. Not open to students with credit for MAT 291. The sequence MAT 270, 271, 272 may be substituted to satisfy requirements for MAT 290 and 291. Prerequisite with a grade of “C” or higher: MAT 270 (or its equivalent).

MAT 272 Calculus with Analytic Geometry III. (4)
fall, spring, summer
Vector-valued functions of several variables, multiple integration, and introduction to vector analysis. The sequence MAT 270, 271, 272 may be substituted to satisfy requirements for MAT 290 and 291. Prerequisite with a grade of “C” or higher: MAT 271 (or its equivalent).

MAT 274 Elementary Differential Equations. (3)
fall, spring, summer
Introduction to ordinary differential equations, adapted to the needs of students in engineering and the sciences. MAT 272 (or its equivalent) is recommended. Prerequisite: MAT 271 (or its equivalent).

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “Univ ersity Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
MAT 290 Calculus I. (5)
\textit{not regularly offered}
Differential and integral calculus of elementary functions; topics from analytic geometry essential to the study of calculus. Prerequisite: MAT 170 (or its equivalent).
General Studies: MA

MAT 291 Calculus II. (5)
\textit{not regularly offered}
Further applications of calculus, partial differentiation, multiple integrals, and infinite series. Prerequisite: MAT 290 (or its equivalent).

MAT 294 Special Topics. (1–4)
fell and spring
Inversion techniques including recurrence relations, generating functions, and method of lines. Those seeking a methods survey course should take MAT 421. Prerequisites: a combination of MAT 342 and 371 and fluency in computer programming (preferably FORTRAN) or only instructor approval.
General Studies: CS

MAT 300 Mathematical Structures. (3)
fall and spring
Logic and set theory, induction, functions, order and equivalence relations, cardinality. Emphasis on writing proofs. Prerequisite: 1 semester of calculus or instructor approval.
General Studies: L

MAT 310 Introduction to Geometry. (3)
spring
Congruence, area, parallelism, similarity and volume, and Euclidean and non-Euclidean geometry. Prerequisite: MAT 272 (or its equivalent).

MAT 320 Linear Algebra. (3)
fall, spring, summer
Linear equations, matrices, determinants, vector spaces, bases, linear transformations and similarity, inner product spaces, eigenvectors, orthonormal bases, diagonalization, and principal axes. Prerequisites: MAT 272 (or its equivalent).

MAT 351 Mathematical Methods for Genetic Analysis. (3)
fall and spring
Discrete mathematics, probability, statistics, and associated computer packages. Applications to genomics, bioinformatics, forensics, and DNA/protein sequence patterns. Prerequisite: MAT 251 or 270 or instructor approval.
General Studies: CS

MAT 362 Advanced Mathematics for Engineers and Scientists. (3)
fall, spring, summer
Vector analysis, Fourier analysis, and partial differential equations. Prerequisites: MAT 272 and 274 (or their equivalents).

MAT 370 Intermediate Calculus. (3)
fall and spring
Theory behind basic 1-variable calculus: continuity, derivative, Riemann integral, sequences, and series. Not open to students who have received a "C" or higher in MAT 371. Students may not count both MAT 370 and 371 toward a mathematics degree. Prerequisites: MAT 272, 300.

MAT 371 Advanced Calculus I. (3)
fall and spring
Real numbers, completeness, sequences/series, continuity, uniform theorems, derivative, Riemann integral, pointwise/uniform convergence, Taylor's theorem. Students may not count both MAT 370 and 371 toward a mathematics degree. Prerequisite: MAT 272 or 300 or instructor approval.

MAT 372 Advanced Calculus II. (3)
spring
Open, closed, compact sets in \( \mathbb{R}^n \): continuity, differentiation, partial differentiation, integration in \( \mathbb{R}^n \); inverse/implicit function theorems. Not open to students with credit for MAT 460. Prerequisite: MAT 371. Pre-or corequisite: MAT 342.

MAT 401 Introduction to General Topology. (3)
\textit{once a year}
Topological spaces, metric spaces, compactness, connectedness, and product spaces. Prerequisite: MAT 300 or 371 or instructor approval.

MAT 415 Introduction to Combinatorics. (3)
fell
Topics include proof techniques, permutations, combinations; counting techniques including recurrence relaxations, generating functions, inclusion-exclusion; Ramsey theory and combinatorial designs. Prerequisites: both MAT 300 (or 243) and 342 (or 242) or only instructor approval.

MAT 416 Introduction to Graph Theory. (3)
spring
Topics include trees, cycles, matchings, planarity, connectivity, Hamiltonicity, colorings, graph algorithms, and other advanced topics. Prerequisites: both MAT 300 (or 243) and 342 (or 242) or only instructor approval.

MAT 419 Introduction to Linear Programming. (3)
spring
Simplex method, duality, and network flows. Applications to game theory, geometry, combinatorics, graph theory, and posets. Prerequisites: a combination of CSE 100 (or 200 or 210) and MAT 300 (or 243) and 342 (or 242) or only instructor approval.
General Studies: CS

MAT 420 Scientific Computing. (3)
fell
Survey and application of programming languages, libraries, and scientific visualization tools. Programming assignments emphasize software development skills. Lecture, lab. Prerequisites: a combination of CSE 200 and MAT 274 and 342 (or their equivalents) or only instructor approval.

MAT 423 Numerical Analysis I. (3)
fell
Analysis and algorithms for numerical solutions linear/nonlinear equations, direct solvers, iterative procedures, optimization. Determination of eigenvalues. Elementary computer arithmetic. Prerequisites: a combination of MAT 342 and 371 and fluency in computer programming or only instructor approval.
General Studies: CS

MAT 425 Numerical Analysis II. (3)
spring
Analysis of and algorithms for numerical interpolation, integration, and differentiation. Numerical solution of ordinary differential equations, and method of lines. Those seeking a methods survey course should take MAT 421. Prerequisites: a combination of MAT 342 and 371 and fluency in computer programming or only instructor approval.
General Studies: CS

MAT 427 Computer Arithmetic. (3)
\textit{not regularly offered}
Number systems, hardware/software arithmetic, overflow, significance, rounding, multiple precision, and automatic error control; impact on languages, architectures, robust programming, and software development. Prerequisite: only CSE 100 (or 200) or both MAT 421 and 423 (or 425) or only instructor approval.
General Studies: CS

MAT 442 Advanced Linear Algebra. (3)
fell
Fundamentals of linear algebra, dual spaces, invariant subspaces, canonical forms, bilinear and quadratic forms, and multilinear algebra. Prerequisites: both MAT 300 and 342 or only instructor approval.

MAT 443 Introduction to Abstract Algebra. (3)
fell
Introduction to concepts of abstract algebra. Not open to students with credit for MAT 444. Prerequisites: both MAT 300 and 342 or only instructor approval.

MAT 444 Intermediate Abstract Algebra. (3)
spring
Basic theory of groups, rings, and fields, including an introduction to Galois theory. Appropriate as preparation for MAT 543. Prerequisite: MAT 443 or graduate standing or instructor approval.

MAT 445 Theory of Numbers. (3)
spring
Prime numbers, unique factorization theorem, congruences, Diophantine equations, primitive roots, and quadratic reciprocity theorem. Prerequisites: both MAT 300 and 342 or only instructor approval.
MAT 447 Cryptography. (3)  
fall and spring  
Block ciphers, stream ciphers, congruence arithmetic, information theory, public key cryptosystems, key exchange, electronic signatures. Prerequisites: MAT 242 (or 342); 300.

MAT 451 Mathematical Modeling. (3)  
spring  
Detailed study of 1 or more mathematical models that occur in the physical or biological sciences. May be repeated for credit with instructor approval. Prerequisites: both MAT 242 (or 342) and 274 or only instructor approval.

MAT 452 Introduction to Chaos and Nonlinear Dynamics. (3)  
fall  
Properties of nonlinear dynamical systems; dependence on initial conditions; strange attractors; period doubling; bifurcations; symbolic dynamics; Smale-Birkhoff theorem; and applications. MAT 371 is recommended. Prerequisites: MAT 274, 342 (or 242).

MAT 455 Introduction to Fractals and Applications. (3)  
spring  
Fractals; self-similar structures, fractals with iterated function systems of maps, computing fractals, fractal dimensions, chaotic dynamics on fractals, applications. MAT 371 is recommended. Prerequisites: MAT 274, 342 (or 242).

MAT 460 Vector Calculus. (3)  
spring  
Vectors, curvilinear coordinates, Jacobians, implicit function theorem, line and surface integrals, Green’s, Stokes’, and divergence theorems. Not open to students with credit for MAT 372. Prerequisites: MAT 242 (or 342), 274, 277.

MAT 461 Applied Complex Analysis. (3)  
fall and summer  
Analytic functions, complex integration, Taylor and Laurent series, residue theorem, conformal mapping, and harmonic functions. Prerequisite: MAT 272 (or its equivalent).

MAT 462 Applied Partial Differential Equations. (3)  
spring  
Second-order partial differential equations, emphasizing Laplace, wave, and diffusion equations. Solutions by the methods of characteristics, separation of variables, and integral transforms. Prerequisites: MAT 242 (or 342), 274.

MAT 472 Intermediate Real Analysis. (3)  
fall  
Introduction to analysis in metric spaces with emphasis on the real line. Appropriate as preparation for MAT 570. Prerequisites: MAT 300, 342.

MAT 475 Differential Equations. (3)  
fall  
Asymptotic behavior of solutions of linear and nonlinear ordinary differential equations, stability, Sturm-Liouville problems, boundary value problems, and singular point behavior of autonomous systems. Prerequisites: MAT 242 (or 342), 274.

MAT 476 Partial Differential Equations. (3)  
spring  
First-order quasilinear, second-order linear (wave, Laplace, heat). Characteristics, harmonic functions, maximum principles, Fourier series, separation of variables. Prerequisites: MAT 274 (or 475), 372 (or 472).

MAT 484 Internship. (1–12)  
not regularly offered  

MAT 485 History of Mathematics. (3)  
not regularly offered  
Topics from the history of the origin and development of mathematical ideas. Prerequisite: MAT 272 (or its equivalent).

MAT 505 Perturbation Methods. (3)  
not regularly offered  
Nonlinear oscillations, strained coordinates, renormalization, multiple scales, boundary layers, matched asymptotic expansions, turning point problems, and WKBJ method. Cross-listed as MAE 505. Credit is allowed for only MAE 505 or MAT 505.

MAT 514 Enumerative Combinatorics I. (3)  
fall  
First semester of a systematic development of enumerative combinatorics including: elementary counting techniques, sieve methods, and partially ordered sets. Prerequisite: graduate standing or instructor approval.

MAT 515 Enumerative Combinatorics II. (3)  
spring  
Second semester of a systematic development of enumerative combinatorics including: lattices, exponential structures, symmetric functions, and selected special topics. Prerequisite: MAT 514 or instructor approval.

MAT 516 Graph Theory I. (3)  
fall  
First semester of a systematic development of graph theory including: matchings, connectivity, arboricity, planarity, coloring, network flows. Prerequisite: graduate standing or instructor approval.

MAT 517 Graph Theory II. (3)  
spring  
Second semester of a systematic development of graph theory including: dense and sparse graphs, Ramsey theory, hamiltonicity, random graphs, minors. Prerequisite: MAT 516 or instructor approval.

MAT 518 Combinatorial Optimization I. (3)  
fall  
First semester of a systematic development of combinatorial optimization including: matroid algorithms, theory of NP-completeness, polynomial time approximation, dynamic programming. Prerequisite: MAT 518 or instructor approval.

MAT 520 Numerical Linear Algebra. (3)  
fall  
Direct solution of linear systems, iterative methods, eigenvalues and eigenvectors, singular value decomposition, the QR algorithm, error propagation, arithmetic, and stability. Prerequisites: both MAT 342 and 423 (or 421) or only instructor approval.

MAT 521 Iterative Methods. (3)  
spring  
Numerical methods for solving linear/nonlinear systems of equations (symmetric, nonsymmetric). Iterative methods for linear systems, conjugate gradients, multigrid methods, preconditioning, Krylov methods. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 523 Numerical Optimization. (3)  
not regularly offered  
Linear programming, unconstrained nonlinear minimization, line search algorithms, conjugate gradients, quasi-Newton methods, constrained nonlinear optimization, gradient projection, and penalty methods. Prerequisites: MAT 342 or 371 or 460 or 520 (or its equivalent) or instructor approval.

MAT 524 Parallel Numerical Algorithms. (3)  
not regularly offered  
Algorithms for massively parallel, hypercube architectures; “parallel” FORTRAN; solution of linear, nonlinear systems; partial differential equations; iterative methods; multigrid; domain decomposition. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 530 Numerical Solution of Ordinary Differential Equations. (3)  
fall  
One step, linear multistep methods; consistency, order, stability, convergence; discretization, roundoff errors, error estimation, adaptive strategy; implementation, software for nonstiff equations. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

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MAT 531 Numerical Solution of Stiff Differential Systems. (3)  
Spring  
Runge-Kutta methods, order conditions, construction of highly stable methods, order stars, error estimation, stepsize selection, contractivity properties, linear multistep methods. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 533 Computational Elliptic and Parabolic Partial Differential Equations. (3)  
Fall  
Parabolic and elliptic equations, finite difference, finite element methods, stability, consistency, convergence, practical aspects, applications, software. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 534 Computational Hyperbolic Partial Differential Equations. (3)  
Spring  
Numerical solutions of hyperbolic PDEs, finite difference methods, well-posedness, stability, consistency, convergence, adaptive grids; Maxwell's equations, elastic wave propagation; Navier-Stokes. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 535 Spectral Methods for Partial Differential Equations. (3)  
Not regularly offered  
Spectral, pseudospectral theory; Galerkin, collocation methods; Tau-methods, global approximation properties, stability; convergence; solutions for linear, nonlinear systems. Prerequisites: both MAT 371 and 423 (or 421) or only instructor approval.

MAT 543 Abstract Algebra. (3)  
Fall  
Groups, modules, rings and fields, Galois theory, homological algebra, and the representation theory. Prerequisite: MAT 444 or instructor approval.

MAT 544 Abstract Algebra. (3)  
Spring  
Continuation of MAT 543. Prerequisite: MAT 543 or instructor approval.

MAT 551 Linear Operators and Integral Equations. (3)  
Spring  
Bounded linear and compact operators on Hilbert spaces. Linear integral equations, Fredholm and Hilbert-Schmidt theory, and approximate methods. Distributions. Prerequisites: MAT 242 and 462 (or their equivalents).

MAT 555 Fractal Geometry. (3)  
Not regularly offered  
Geometry and analysis of fractal sets; definitions of dimensions; calculating dimensions; projections, products of fractals; random fractals; multifractal measures; and applications. Prerequisites: MAT 371, 455. MAT 472 is recommended.

MAT 560 Dynamical Systems Methods in Fluid Dynamics. (3)  
Fall  
Applications of modern dynamical systems methods to fluid mechanics: bifurcations, normal forms, nonlinear dynamics, pattern formation, mixing, and Lagrangian chaos. Prerequisite: graduate standing or instructor approval.

MAT 570 Real Analysis. (3)  
Spring  
Lebesgue integration, selected function spaces, differentiation, abstract measure theory, and elements of functional analysis. Prerequisite: MAT 372 or instructor approval.

MAT 571 Real Analysis. (3)  
Fall  
Continuation of MAT 570. Prerequisite: MAT 570 or instructor approval.

MAT 572 Complex Analysis. (3)  
Fall  
Analytic functions, series and product representations, entire and meromorphic functions, normal families, Riemann mapping theorem, harmonic functions, and Riemann surfaces. Prerequisite: MAT 371 or instructor approval.

MAT 573 Complex Analysis. (3)  
Spring  
Continuation of MAT 572. Prerequisite: MAT 572 or instructor approval.

MAT 574 Theory of Ordinary Differential Equations. (3)  
Not regularly offered  
Systems, existence proofs, singularities, asymptotic behavior of solutions, boundedness of solutions, eigenvalues and eigenfunctions, and perturbation theory. Prerequisite: MAT 372 or instructor approval.

MAT 575 Theory of Ordinary Differential Equations and Dynamical Systems. (3)  
Not regularly offered  
Geometric approach to ODEs and dynamical systems; (un)stable, center manifolds; structural stability; normal forms; averaging; chaos; persistence. May be repeated for credit with instructor approval. Prerequisites: both MAT 472 and 475 or only MAT 574 or only instructor approval.

MAT 576 Theory of Partial Differential Equations. (3)  
Not regularly offered  
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.

MAT 577 Theory of Partial Differential Equations. (3)  
Not regularly offered  
Continuation of MAT 576. Prerequisite: MAT 576 or instructor approval.

MAT 578 Functional Analysis. (3)  
Not regularly offered  
Locally convex, normed, and Hilbert spaces. Linear operators, spectral theory, and application to classical analysis. Prerequisite: MAT 472 or 571 or instructor approval.

MAT 579 Functional Analysis. (3)  
Not regularly offered  
Continuation of MAT 578. Prerequisite: MAT 578 or instructor approval.

MAT 591 Seminar. (1–12)  
Not regularly offered  
Possible topics:  
(a) Algebra. (1–3)  
(b) Analysis. (1–3)  
(c) Applied Mathematics. (1–3)  
(d) Combinatorial Mathematics. (1–3)  
(e) Mathematical Logic. (1–3)  
(f) Numerical Analysis. (1–3)  
(g) Topology. (1–3)

MATHEMATICS EDUCATION (MTE)

MTE 180 Theory of Elementary Mathematics. (3)  
Fall, Spring, Summer  
Number systems, intuitive geometry, elementary algebra, and measurement. Intended for prospective elementary school teachers. Prerequisite: MAT 117 (or its equivalent).

MTE 181 Theory of Elementary Mathematics. (3)  
Once a Year  
Continuation of MTE 180. Prerequisite: MTE 180 or instructor approval.

MTE 380 Arithmetic in the Elementary School. (3)  
Once a Year  
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.

MTE 381 Geometry in the Elementary School. (3)  
Not regularly offered  
Informal geometry, including concepts of length, area, volume, similarity, and congruence. Classification of figures, straightedge and compass constructions, and motion geometry. Prerequisite: MTE 380 or instructor approval.

MTE 482 Methods of Teaching Mathematics in Secondary School. (3)  
Fall  
Examines secondary school curricular material and analyzes instructional devices. Teaching strategies, evaluative techniques, diagnosis, and remediation and problem solving. Prerequisite: instructor approval.
MTE 483 Mathematics in the Secondary School. (3)
fall
Topics in geometry, number theory, algebra, and analysis. Emphasis on unifying principles. Prerequisite: MAT 310 or instructor approval.

MTE 484 Theory of Elementary Mathematics Internship. (3)
fall and spring
Requires hands-on activities and manipulatives to advance mathematical understanding in second- to fourth-grade students.

MTE 494 Special Topics. (1–4)
fall and spring
Possible topics:
(a) Advanced Methods of Teaching Secondary Mathematics. (3)
Continuation of MTE 482. Prerequisite: MTE 482.

MTE 585 Modern Geometry for Teachers. (3)
once a year
Euclidean, projective, and non-Euclidean geometries. Prerequisite: instructor approval.

MTE 587 Analysis for Teachers. (3)
not regularly offered
Subject matter in mathematics appropriate for accelerated programs in secondary schools, including analytic geometry and calculus. Prerequisite: instructor approval.

STATISTICS AND PROBABILITY (STP)

STP 220 Conceptual Statistics. (3)
fall and spring
Treats the concepts and vocabulary needed to evaluate statistical reports on health, technology, and society. Aggressively emphasizes understanding over computation. Lecture, teamwork. Prerequisite: MAT 114 or 117 (or its equivalent).

General Studies: CS

STP 226 Elements of Statistics. (3)
fall, spring, summer
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: MAT 114 or 117 (or its equivalent).

General Studies: CS

STP 326 Intermediate Probability. (3)
fall and spring
Probability models and computations, joint and conditional distributions, moments, and families of distributions. Topics in stochastic processes, simulation, and statistics. Prerequisite: MAT 210 (or its equivalent).

General Studies: CS

STP 420 Introductory Applied Statistics. (3)
fall, spring, summer
Introductory probability, descriptive statistics, sampling distributions, parameter estimation, tests of hypotheses, chi-square tests, regression analysis, analysis of variance, and nonparametric tests. Prerequisite: MAT 117 (or its equivalent).

General Studies: CS

STP 421 Probability. (3)
fall
Laws of probability, combinatorial analysis, random variables, probability distributions, expectations, moment-generating functions, transformations of random variables, and central limit theorem. Prerequisites: MAT 272 and 300 and STP 420 (or their equivalents).

STP 425 Stochastic Processes. (3)
spring
Markov chains, stationary distributions, pure jump processes, 2D order processes, and other topics in stochastic processes. Prerequisites: MAT 342; STP 421.

STP 427 Mathematical Statistics. (3)
spring
Limiting distributions, interval estimation, point estimation, sufficient statistics, and tests of hypotheses. Prerequisites: STP 420, 421.

STP 429 Experimental Statistics. (3)
spring
Statistical inference for controlled experimentation. Multiple regression, correlation, analysis of variance, multiple comparisons, and nonparametric procedures. Prerequisite: STP 420 (or its equivalent).

General Studies: CS

STP 525 Advanced Probability. (3)
not regularly offered
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: both MAT 571 and STP 421 or only instructor approval.

STP 526 Theory of Statistical Linear Models. (3)
fall
Multinormal distribution, distribution of quadratic forms, full and nonfull rank models, generalized inverses, unbalanced data, variance components, and the large sample theory. Prerequisites: STP 427; knowledge of matrix algebra.

STP 530 Applied Regression Analysis. (3)
spring
Method of least squares, simple and multiple linear regression, polynomial regression, analysis of residuals, dummy variables, and model building. Prerequisite: STP 420 (or its equivalent).

STP 531 Applied Analysis of Variance. (3)
spring
Factorial designs, balanced and unbalanced data, fixed and random effects, randomized blocks, Latin squares, analysis of covariance, and multiple comparisons. Prerequisite: STP 420 (or its equivalent).

STP 532 Applied Nonparametric Statistics. (3)
fall
One-sample test, tests of 2 or more related or independent samples, measures of correlation, and tests of trend and dependence. Prerequisite: STP 420 (or its equivalent).

STP 533 Applied Multivariate Analysis. (3)
spring
Discriminant analysis, principal components, factor analysis, cluster analysis, and canonical correlation. Prerequisite: STP 420 (or its equivalent).

STP 534 Applied Discrete Data Analysis. (3)
not regularly offered
Models for discrete and count data, measures of association, and log-linear and regression models for contingency tables. Prerequisite: STP 420 (or its equivalent).

STP 535 Applied Sampling Methodology. (3)
spring
Simple random, stratified, cluster sampling; variance estimation in complex surveys; nonparametric superpopulation approaches; nonresponse models; computational methods. Prerequisite: STP 420 (or its equivalent).

STP 591 Seminar. (1–12)
not regularly offered
Possible topics:
(a) Probability. (1–3)
(b) Statistics. (1–3)

STP 593 Applied Project. (1–12)
not regularly offered

STP 599 Thesis. (1–12)
not regularly offered

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PROFESSORS
BURKE, HARRINGTON, JACOBS, MOSSMAN, SCHMIDT

ASSOCIATE PROFESSORS
BIRGE, HOFFMAN, MISRA, STOUT

ASSISTANT PROFESSORS
CHANG, GARCIA-PICHEL

CLINICAL FACULTY
DOWNS, LEFEVRE, MASS, ROBERTS

MICROBIOLOGY—B.S.

The B.S. degree in 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 General Biology SQ ................................. 4
BIO 182 General Biology SG ................................. 4
BIO 340 General Genetics ........................................ 4

Choose between the course combinations below ....................... 8
BCH 361 Principles of Biochemistry (3)
BCH 367 Elementary Biochemistry Laboratory (1)
CHM 231 Elementary Organic Chemistry SQ 1 (3)
CHM 235 Elementary Organic Chemistry Laboratory SQ 1 (1) 1

CHM 331 General Organic Chemistry (3)
CHM 332 General Organic Chemistry (3)
CHM 335 General Organic Chemistry Laboratory (1)
CHM 336 General Organic Chemistry Laboratory (1)

MIC 206 Microbiology Laboratory SG 2 ........................ 1

MIC 220 Biology of Microorganisms ............................. 3

MIC 302 Advanced Bacteriology Laboratory L 3 ............ 2

MIC 360 Bacteriological Physiology ............................ 3

MIC 401 Research Paper L 3 .................................... 1

Total .............................................................................. 30

1 Both CHM 231 and 235 must be taken to secure SQ credit.
2 Both MIC 205 and 206 must be taken to secure SG credit.
3 Both MIC 302 and 401 must be taken to secure L credit.

A minimum of 11 semester hours of upper-division electives in microbiology or approved related fields must be taken.

These elective hours must include two courses chosen from the following:

MIC 421 Experimental Immunology ............................. 2
MIC 446 Techniques in Molecular Biology/Genetics Lab .... 2
MIC 470 Bacterial Diversity and Systematics ................... 4

MIC 494 ST: Clinical Bacteriology Laboratory .................... 3
MIC 495 Undergraduate Research ................................ 2

In addition, students are required to fulfill the university mathematical studies requirements with MAT 210 (or 270, 290, or 294) as their MA course and BIO 420 (or any CSE course that meets the CS requirement). The required supplemental courses are as follows:

CHM 113 General Chemistry SQ ..................................... 4
CHM 115 General Chemistry with Qualitative Analysis SQ .. 5

PHY 111 General Physics SQ ............................. 3
PHY 112 General Physics SQ ............................. 3

PHY 113 General Physics Laboratory SQ .................... 1
PHY 114 General Physics Laboratory SQ .................... 1

Total ............................................................................. 17

* Both PHY 111 and 113 or PHY 112 and 114 must be taken to secure SQ credit.

CLINICAL LABORATORY SCIENCES—B.S.

The goal of the Clinical Laboratory Sciences degree program is to prepare individuals to practice in the field of clinical laboratory sciences, which includes the major disciplines of clinical chemistry, hematology, immuno-hematology, immunology, and microbiology. Employment opportunities exist in hospital, private, physician, and research laboratories and in government, sales, management, and education. After obtaining a B.S. degree in Clinical Laboratory Sciences, the graduate is eligible for national certification by examination.

A student majoring in Clinical Laboratory Sciences is required to take 40 hours of clinical laboratory sciences courses. Also required are the following courses:

BCH 361 Principles of Biochemistry .................................. 3
BIO 360 Animal Physiology ......................................... 4

CHM 113 General Chemistry SQ ............................. 4

CHM 231 Elementary Organic Chemistry SQ 1 (3)

MIC 205 Microbiology SQ 2 .................................... 3

or MIC 220 Biology of Microorganisms (3) 1

MIC 206 Microbiology Laboratory SG 2 .................... 1

Total ............................................................................. 18

1 Both CHM 231 and 235 must be taken to secure SQ credit.
2 Both MIC 205 and 206 must be taken to secure SG credit.

Equivalent courses may be substituted upon approval of an advisor. 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 all students to be accepted into the professional study program due to space limitations at the clinical affiliates and restrictions of program accreditation. For more information on 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.

MINOR IN MICROBIOLOGY

The minor in Microbiology consists of a minimum of 24 semester hours. Required courses are as follows:

BIO 181 General Biology SQ ..................................... 4
BIO 182 General Biology SG ..................................... 4
BIO 340 General Genetics .......................................... 4

MIC 206 Microbiology Laboratory SG 1 ........................ 1
MIC 220 Biology of Microorganisms ............................ 3
For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

NOTE:  The remaining upper-division microbiology courses are chosen in consultation with an advisor. Students majoring in Biology may not minor in Microbiology.

GRADUATE PROGRAMS

The faculty in the Department of Microbiology offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. See the Graduate Catalog for requirements.

The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. See the Graduate Catalog for courses, faculty, and program information, or call 480/965-0743 for more information.

CLINICAL LABORATORY SCIENCES/ MEDICAL TECHNOLOGY (CLS)

CLS 100 Introduction to Clinical Laboratory Sciences. (1) Fall
Introduction to the field of clinical laboratory sciences. Required for Clinical Laboratory Sciences majors.

CLS 310 Principles of Clinical Chemistry I. (6) Spring
Theory and application of principles of clinical chemistry, with emphasis on laboratory techniques, pathophysiology, methods of analysis, and assessment of procedure. 3 hours lecture, 9 hours lab. Fee. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 320 Principles of Clinical Microbiology I. (6) Spring
Theory and application of principles of clinical microbiology with emphasis on isolation and identification of medically significant fungi and bacteria. 3 hours lecture, 9 hours lab. Fee. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 330 Principles of Clinical Hematology I/Body Fluids. (3) Fall
Theory and application of principles in hematology, with emphasis on techniques to evaluate blood dyscrasias and analyze body fluids. 2 hours lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 410 Principles of Clinical Chemistry II. (2) Summer
Continuation of CLS 310 with emphasis on principles of advanced clinical chemistry. 1 hour lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 411 Advanced Applications of Clinical Chemistry. (4) Fall
Clinical application of theory/techniques from CLS 310 and 410. Emphasis on operation of common laboratory instrumentation and clinical correlation. Minimum 180 hours practical. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 420 Principles of Microbiology II. (2) Summer
Disease mechanisms and identification of medically significant parasites, Mycobacteria, Actinomycetes, Chlamydia, Rickettsia, Mycoplasma, and viruses. 1 hour lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 421 Advanced Applications of Clinical Microbiology. (4) Spring
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 practical. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 430 Principles of Clinical Hematology II/Hemostasis. (3) Fall
Theory and applications of principles in hematology with emphasis on etiology, pathophysiology, clinical manifestations, and treatment of blood dyscrasias/hemostatic defects. 2 hours lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 431 Advanced Applications of Clinical Hematology. (4) Spring
Practical laboratory application of methods/techniques used to evaluate and diagnose blood dyscrasias/hemostatic defects. Applied techniques in body fluid analysis. Minimum 180 hours practical. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 440 Principles of Clinical Immunology/Immunohematology. (4) Fall
Theoretical and practical application of clinical immunology and immunohematology. Emphasizes serological techniques that aid disease diagnosis and blood donor selection. 3 hours lecture, 3 hours lab. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 441 Advanced Applications of Clinical Immunology/Immunohematology. (3) Spring
Practical laboratory application of the principles of serological methods used in diagnosing disease and selecting blood components for transfusion therapy. Minimum 135 hours practical. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 450 Principles of Clinical Laboratory Administration. (2) Fall and Spring
Principles of management, with emphasis on the clinical laboratory. Basic management process, personnel supervision, identification, and allocation of resources. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

CLS 460 Principles of Clinical Laboratory Education. (1) Spring
Principles of learning, with application to the development of instructional objectives, strategies, and evaluation for teaching-learning situations in the laboratory. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.

MICROBIOLOGY (MIC)

MIC 205 Microbiology. (3) Fall, Spring, Summer
Basic course for students without credit in BIO 181, emphasizing general principles; role of microorganisms in health, ecology, and applied fields. May not be used for Microbiology major credit unless a diagnostic test is passed. Prerequisites: both BIO 100 (or PLB 108) and CHM 101 or only instructor approval.

MIC 206 Microbiology Laboratory. (1) Fall, Spring, Summer
Principles and laboratory techniques used in identifying and handling microorganisms. 3 hours lab. Fee. Pre- or corequisite: MIC 205 or 220.

MIC 220 Biology of Microorganisms. (3) Fall and Spring
Basic course for students with credit in BIO 181. Detailed study of microbial cells, their structure, genetics, physiology, and taxonomy. Corequisites: BIO 182; CHM 115.

MIC 302 Advanced Bacteriology Laboratory I. (2) Spring
Mycobacterium, Actinomycetes, Chlamydia, Rickettsia, Mycoplasma, and viruses. 1 hour lecture, 3 hours lab. Fee. Prerequisite: admission to the Clinical Laboratory Sciences professional study program.
MIC 302 Advanced Bacteriology Laboratory. (2)  
fall and spring  
Advanced laboratory techniques in bacterial growth, physiology, genetics, and microscopy. Required of Microbiology majors. 4 hours lab. Fee. Prerequisites: completion of General Studies L requirement and either A or B. (A) MIC 206 and 220 or (B) MIC 205 and 206 and instructor approval.  
General Studies: L (if credit also earned in MIC 401)

MIC 360 Bacterial Physiology. (3)  
fall and spring  
Mechanisms and control of cell metabolism, structures, and functions. Prerequisite: MIC 220. Pre- or corequisite: BCH 361 or instructor approval.

MIC 380 Medical Parasitology. (3)  
fall  
Parasitic diseases of humans, including life cycle events and clinical manifestations. Prerequisite: MIC 205 or 220.

MIC 381 Pathogenic Bacteria. (3)  
spring  
Host-microbial interactions in infectious disease, with emphasis on pathogenesis, host defenses, and molecular mechanisms of microbial virulence. Prerequisite: MIC 360 or 6 hours in microbiology with instructor approval.

MIC 401 Research Paper. (1)  
fall, spring, summer  
Paper of 15 or more pages based on library or laboratory research in collaboration with a faculty member. Required of all Microbiology majors. Prerequisites: MIC 302; completion of General Studies L requirement.  
General Studies: L (if credit also earned in MIC 302)

MIC 420 Immunology: Molecular and Cellular Foundations. (3)  
fall  
Molecular and cellular foundations of immunology. Antibody/antigen interactions, cellular response, cytokines, immunogenetics, immunoregulation, autoimmunity, psychoneuroimmunology research/medical perspectives. Prerequisites: both CHM 231 (or 331) and MIC 205 (or 220) or only instructor approval.

MIC 421 Experimental Immunology. (2)  
fall and spring  
Introduction to the basic techniques, methods, and assays used in immunology. 6 hours lab. Fee. Prerequisites: a combination of CHM 231 and 331 and MIC 302 or only instructor approval.

MIC 425 Advanced Immunology. (3)  
spring in odd years  
Survey of recent advances in immunology, including lymphocyte membranes, lymphokines/biochemistry, molecular genetics, theoretical immunology, immunoregulation, neuroimmunology, and immunologic diseases. Prerequisite: MIC 420 or instructor approval.

MIC 441 Bacterial Genetics. (3)  
spring  
Survey of genetic exchange and regulatory processes in bacteria and their viruses. Bacteria and viruses as tools in genetic engineering. Prerequisites: both BIO 340 and MIC 205 or 220 or only instructor approval.

MIC 442 Bacterial Genetics Laboratory. (1)  
not regularly offered  
Techniques of mutagenesis, mapping, and strain and genetic library construction. 4 hours lab. Prerequisites: MIC 206, 302. Pre- or corequisite: MIC 441.

MIC 445 Techniques in Molecular Biology/Genetics. (2)  
fall and spring  
Molecular genetic principles: plasmid construction, purification, and characterization; PCR; mutageneses; hybridization and sequence analysis; protein quantitation; immunologic detection and electrophoresis. Cross-listed as MBB 445. Credit is allowed for only MBB 445 or MIC 445. Prerequisites: both BIO 340 and MIC 302 or only instructor approval.

MIC 446 Techniques in Molecular Biology/Genetics Lab. (2)  
fall and spring  
Molecular genetic techniques: plasmid construction, purification, and characterization; PCR; mutageneses; hybridization and sequence analysis; protein quantitation; immunologic detection and electrophoresis. Cross-listed as MBB 446. Credit is allowed for only MBB 446 or MIC 446. Pre- or corequisite: MBB 445 or MIC 445.

MIC 470 Bacterial Diversity and Systematics. (4)  
fall  
Biology, classification, and enrichment culture of the nonpathogenic bacteria. 2 hours lecture, 6 hours lab. Fee. Prerequisite: MIC 302.

MIC 485 General Virology. (3)  
fall  
Fundamental nature of viruses, their replication, pathogenesis, and ecology. Prerequisites: both BIO 340 and CHM 331 or only instructor approval.

MIC 486 General Virology Laboratory. (2)  
not regularly offered  
Fundamentals of virus detection, isolation and assay, propagation of virus in mammalian cell culture, recombinant virus and vector construction. 6 hours lab. Prerequisite: MIC 302. Pre- or corequisite: MIC 485.

MIC 494 Special Topics. (1–4)  
not regularly offered  
Possible topics:  
(a) Clinical Bacteriology Laboratory. (3)

MIC 495 Undergraduate Research. (1–6)  
fall, spring, summer  
Supervised research in microbiology. May be repeated for credit. Lab. Prerequisites: MIC 206, 220, 302; instructor approval.

MIC 527 Neuroimmunology. (3)  
spring in odd years  
Studies mind's influence on immunity and the immune system's influence on the mind, neuroimmunologic diseases, and the neuroimmunological circuitry involved. Seminar. Prerequisite: MIC 420 or instructor approval.

MIC 581 Molecular Mechanism of Pathogenesis. (3)  
not regularly offered  
Pathogenic mechanisms and host responses in viral and/or bacterial diseases. Prerequisites: both MIC 381 and 420 or only instructor approval.

MIC 585 Molecular Virology. (3)  
not regularly offered  
Selected topics concerning molecular aspects of eukaryotic virus replication and pathogenesis. Prerequisite: instructor approval.

MIC 591 Seminar. (1–12)  
fall and spring  
Possible topics:  
(a) Bacterial Ecology. (1–3)  
(b) Current Research in Microbiology. (1–3)  
(c) Enzymology. (1–3)  
(d) Genetic Engineering. (1–3)  
(e) Genetics. (1–3)  
(f) Immunology. (1–3)  
(g) Molecular Virology. (1–3)  
(h) Neuroimmunology. (1–3)  
(i) Pathogenic Bacteriology. (1–3)
Department of Military Science
Army ROTC
Lt. Col. Scott Crawford
Chair
(TCB 104) 480/965-3318
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INSTRUCTOR
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CLINICAL ASSOCIATE PROFESSOR
COX

PURPOSE
The Department of Military Science curriculum consists of the basic course (MIS 101, 102, 201, and 202) and the advanced course (MIS 301, 302, 401, and 402). The goal of this professional education curriculum is to prepare students with leadership potential to be commissioned as U.S. Army officers. Objectives include developing the following characteristics in students: leadership and managerial skills, the ability to think creatively, the ability to speak and write effectively, appreciation of the requirements for national security, and an understanding of the nature and functions of the U.S. Army. Upon successful completion of the advanced course and graduation, qualified students receive commissions in the Active Army (on a competitive basis), U.S. Army Reserve, or Army National Guard.

In addition to the military science curriculum, core courses in the field of national defense studies are both an integral and parallel source of the department’s program. Integ rally, they provide MIS courses at all levels with topical intensity and highlight such professionally related areas as military technology; weapons procurement; national intelligence, secrecy, and counterintelligence; civil-military relations; security coalitions and regional defense communities; national, regional, and global levels of strategy; generalship skill-in-action; deterrence dynamics and structure; military doctrine; service-branch livelihood, appropriations rivalry, and interservice cooperation; personnel recruitment, morale, training, advancement, and bureaucratic organization; military reform; threat and threat perception; military-historical experience and analogy; media and biographical insights; the rationale and matrices of security analysis and research; and independently selectable topics.

The department also fields an independent but parallel set of 400-level courses in the areas of geostrategic, politico-strategic, and national defense policy and analysis—available to students irrespective of Reserve Officers’ Training Corps (ROTC) status, departmental major, or college affiliation—for assigned credit toward General Studies, social science, and global awareness requirements for graduation. (See “Classification of Courses,” page 51, for a description of course 499 Individualized Instruction.)

GENERAL QUALIFICATIONS

Basic Course. Any student who is enrolled in ASU (or approved by the professor of military science) can enter into military science basic classes. It is strongly recommended that the student be in good physical shape because some of the curriculum requires physical exertion.

Advanced Course. Any student who is enrolled in ASU (or approved by the professor of military science) may participate in military science advanced classes. However, to be fully enrolled in the advanced course and compete for and obtain a commission in the U.S. Army, students must meet the following requirements:

1. be a citizen of the United States (noncitizens may enroll but must obtain citizenship before commissioning);
2. be of sound physical condition and pass the U.S. Army physical fitness test;
3. meet the required professional military educational requirements; and
4. be at least 17 years of age for entrance into the advanced course and be able to complete all commissioning requirements before age 27.

Only those students in the basic and advanced courses who meet the required standards according to military regulations are eligible to receive financial assistance through the U.S. Army. Faculty of the Department of Military Science are available during normal office hours to answer questions or provide counseling.

The following are various options open to students who wish to obtain a commission in the U.S. Army. Contact the Department of Military Science personnel 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 12 semester hours of credit for four semesters of study. Upon satisfying the requirements, they enter the advanced course, where they earn 12 additional semester hours for four semesters of study. Students are also required to attend a five-week advanced summer camp at Fort Lewis, Washington, between their junior and senior years. All commissioned officers must meet certain Professional Military Education requirements by completing courses in English, math, and computer literacy. Selected majors such as nursing, engineering, and architecture, among others, may require an additional semester or two, or summer school, to complete all requirements for a degree and commission without excessive course overloads. Upon successful completion of the advanced course and requirements for a degree, students are commissioned as second lieutenants in the Active Duty Army, U.S. Army Reserve, or Army National Guard.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
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 reached academic junior status. This program is open to all students with the exception of three- and four-year Army ROTC scholarship winners (see “Scholarship Programs” on this page). Students seeking enrollment in the two-year program should make application during the spring semester of the calendar year in which they desire to enter the program. They must provide SAT/ACT scores and pass the Army physical fitness test. After successfully completing a paid five-week basic camp, students may enroll in the advanced course. (The camp is conducted during June and July at Fort Knox, Kentucky.) Students who have previous military experience or who are currently members of the National Guard or Reserves may be admitted directly into the two-year program, provided they are academic juniors. 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. The following qualifications are required for admittance to the advanced course:

1. successful completion of the basic course for the students in the four-year ROTC program; for the students in the two-year program, selection for and completion of the six-week basic summer camp or prior military service;
2. score at least 950 on SAT or 19 on ACT;
3. passing the Army physical examination;
4. achieving and maintaining the minimum cumulative GPA required for graduation in the student’s selected major, but no less than 2.00;
5. attainment of at least junior class standing; and
6. maintenance of full-time student status.

Pay and Allowances. Each advanced course student receives one-half the pay of a second lieutenant during 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. All students in the advanced course, regardless of scholarship status, are paid about $1,500 tax-free for each of these two years.

Simultaneous Membership Program. Under this program, ROTC students may simultaneously be members of the Army Reserves or the National Guard. The combination of advance course allowance and pay for Army Reserve or National Guard participation provides more than $1,250 for each semester’s involvement.

Scholarship Programs. The Army ROTC offers scholarship programs for outstanding young men and women who are motivated toward a career as professional officers in the U.S. Army. These scholarships are awarded in varying amounts for tuition. In addition, the scholarship pays $150.00 per month subsistence allowance and $225.00 each semester for textbooks and supplies. A scholarship for four years is available to freshmen who enter the four-year program. Applications must be submitted in accordance with a schedule furnished by high school counselors. Selection is made on a nationwide basis. Scholarships are also 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 a review board on campus. 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 Active Army, Army National Guard, or Army Reserves. 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 of up to four years in call to active duty is available to outstanding students who desire to earn graduate or professional degrees. Special programs for graduate and professional studies are available to both active Army appointees and Reserve component appointees in the following areas: medicine, osteopathy, and clinical psychology.

**MILITARY SCIENCE (MIS)**

**MIS 101 Introduction to the Military. (3)**
- **Fall**
  - Overview of mission, organization, and structure of the Army and its role in national defense; discussion of current military issues. 3 hours lecture/conference, 2 hours lab.

**MIS 102 Land Navigation, First Aid, and Survival. (3)**
- **Spring**
  - Introduction to military maps and land navigation; first aid, and lifesaving techniques; basic outdoor survival skills. 3 hours lecture/conference, 2 hours lab.

**MIS 201 American Military History. (3)**
- **Fall**
  - Studies the role of the military in American life during war and peace from colonial times to the present day. 3 hours lecture/conference, 2 hours lab.

**MIS 202 Introduction to Leadership Dynamics. (3)**
- **Spring**
  - Introduction to interpersonal dynamics involved in military team operations; theory and application of military leadership principles. 3 hours lecture/conference, 2 hours lab.

**MIS 205 ROTC Basic Camp. (4)**
- **Summer**
  - 6-week training program emphasizing practical hands-on skills and leadership development. Taken in lieu of MIS 101, 102, 201, 202. Conducted at Fort Knox, Kentucky.

**MIS 301 Advanced Military Science I. (3)**
- **Fall**
  - Theory and dynamics of the individual soldier and military units in offensive combat operations. 2 hours lecture/conference, 1.5 hours Leadership Practical Application, 1 2-day field exercise, 3 1-day field exercises. Prerequisites: MIS 101 and 102 and 201 and 202 (or their equivalents). Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).

**MIS 302 Advanced Military Science II. (3)**
- **Spring**
  - Theory and dynamics of military units in defensive combat operations. 2 hours lecture/conference, 1.5 hours Leadership Practical Application, 1 3-day field exercise, 2 1-day field exercises. Prerequisites: MIS 101 and 102 and 201 and 202 (or their equivalents). Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).
MIS 303 ROTC Advanced Camp. (4)
summer
6-week training program emphasizing leadership development and advanced military skills, including tactics, land navigation, and physical training. Conducted at Fort Lewis, Washington. Prerequisites: MIS 301, 302.

MIS 401 Advanced Military Science III. (3)
fall
Military legal system; preparation and conduct of military training; leadership development; ethics and professionalism of the military officer. 3 hours lecture/conference, 2 hours Leadership Practical Application, 1 2-day field exercise, 3 1-day field exercises. Prerequisites: MIS 301, 302. Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).

MIS 402 Advanced Military Science IV. (3)
spring
Military correspondence; career planning and personal affairs in service; conduct of training; leadership development; ethics and professionalism of the military officer. 3 hours lecture, 2 hours Leadership Practical Application, 1 3-day field exercise, 2 1-day field exercises. Prerequisites: MIS 301, 302. Corequisite: EPE 105 Physical Education Activity (Army Master Fitness).

MIS 410 American Defense Policy I. (3)
fall
Evolution, organization, and execution of U.S. national security policy. General Studies: SB

MIS 412 American Defense Policy II. (3)
spring
Contemporary problems and analytical issues in the formation and implementation of U.S. national security. Prerequisite: MIS 410. General Studies: SB

MIS 414 Comparative Defense Policy Analysis. (3)
fall
Historical problems and analytical issues in the evolution, organization, application, and control of effective military establishments in various political systems. General Studies: SB

MIS 416 Soviet/C.I.S. Foreign and Defense Policies. (3)
spring
Analysis of foreign and security policies of the Soviet Union/C.I.S. and of the successor states to the Warsaw Pact. General Studies: SB

MIS 499 Individualized Instruction: National Defense Analysis. (1–3)
not regularly offered

Molecular and Cellular Biology

Bertram L. Jacobs
Director, Interdisciplinary Committee
(LSE 411) 480/965-0743
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GRADUATE PROGRAMS

The interdisciplinary M.S. and Ph.D. degrees with a major in Molecular and Cellular Biology are administered by the Interdisciplinary Committee on Molecular and Cellular Biology. The participating faculty are drawn primarily from four core departments (the Departments of Biology, Chemistry and Biochemistry, Microbiology, and Plant Biology), with additional faculty from the Departments of Anthropology and Physics and Astronomy.

For more information, contact the director or see the Graduate Catalog.

MOLECULAR AND CELLULAR BIOLOGY (MCB)
See the Graduate Catalog for the MCB courses.

Molecular Biosciences and Biotechnology

J. Kenneth Hoobler
Chair
Department of Plant Biology
(LSE 210) 480/965-3414

Edward A. Birge
Codirector
Department of Microbiology
(LSE 210) 480/965-1457

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MOLECULAR BIOSCIENCES AND BIOTECHNOLOGY—B.S.

The interdepartmental B.S. degree in Molecular Biosciences and Biotechnology is designed to prepare students for productive careers in rapidly expanding areas within the life sciences, such as biotechnology, medicine, and biomedical research or any area of biology at the molecular and cellular level. Courses and faculty are drawn primarily from the Departments of Plant Biology and Microbiology, with additional participation by the Departments of Biology and Chemistry and Biochemistry.

General Program

The B.S. degree program consists of approximately 55 semester hours of course work in required courses plus two courses in mathematics specifically designed for this program. The required major courses (22 total semester hours) are as follows:

- MBB 245 Cellular and Molecular Biology SQ........................................3
- MBB 246 Cellular and Molecular Biology Laboratory....................................1
- MBB 343 Genetic Engineering and Society.................................................4
- MBB 484 Internship ......................................................................................6
  or MBB 499 Individualized Instruction (6)
- MBB 490 Capstone: Issues in Biotechnology ..................................................4
- MIC 206 Microbiology Laboratory SQ*.......................................................1
- MIC 220 Biology of Microorganisms .........................................................3

Total ..............................................................................................................22

* Both MIC 205 and 206 must be taken for SG credit.

Choose two or more of the following courses (or combinations) for a total of 8 to 16 semester hours:

- BIO 340 General Genetics...........................................................................4
- BIO 353 Cell Biology ...................................................................................3

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
BIO 494 ST: Cell Biotechnology ................................................. 4
MBB 350 Applied Genetics ..................................................... 4
MBB 445 Techniques in Molecular Biology/Genetics ............... 2
MBB 446 Techniques in Molecular Biology/Genetics Lab1 ....... 2
MIC 420 Immunology: Molecular and Cellular Foundations ... 3
MIC 421 Experimental Immunology2 ................................... 2
Total ................................................................................................. 8–16

1 MBB 446 is taken with 445.
2 MIC 421 is taken with 420.

Required supplemental courses in biology, chemistry, and physics (25 total semester hours) are as follows:

BCH 361 Principles of Biochemistry ....................................... 3
BCH 367 Elementary Biochemistry Laboratory ..................... 1
CHM 113 General Chemistry SQ .......................................... 4
CHM 115 General Chemistry with Qualitative Analysis SQ ....... 5
CHM 231 Elementary Organic Chemistry SQ1 ..................... 3
CHM 235 Elementary Organic Chemistry Laboratory SQ1 ....... 1
PHY 111 General Physics SQ2 ............................................... 3
PHY 112 General Physics SQ3 ............................................... 3
PHY 113 General Physics Laboratory SQ2 .............................. 1
PHY 114 General Physics Laboratory SQ1 .............................. 1
Total ................................................................................................. 25

1 Both CHM 231 and 235 must be taken to secure SQ credit.
2 Both PHY 111 and 113 must be taken to secure SQ credit.
3 Both PHY 112 and 114 must be taken to secure SQ credit.

Courses that satisfy university mathematical studies requirements are as follows (six total semester hours):

MAT 251 Calculus for Life Sciences MA ................................. 3
MAT 351 Mathematical Methods for Genetic Analysis CS ....... 3
Total ................................................................................................. 6

Additional courses are available in the life or physical sciences for elective credit.

MOLECULAR BIOSCIENCES/BIOTECHNOLOGY (MBB)

MBB 245 Cellular and Molecular Biology. (3)
fall and spring
Concepts that underlie relationships between cellular and subcellular structure and function, and integration of major metabolic and genetic processes. Prerequisite: Life Science major or preprofessional student in health-related sciences.
General Studies: SQ (if credit also earned in MBB 246)

MBB 246 Cellular and Molecular Biology Laboratory. (1)
fall and spring
Experiments that illustrate relationships between structure, function, and genetic processes at the cellular and molecular level. Laboratory. Prerequisite: MBB 245.
General Studies: SQ (if credit also earned in MBB 245)

MBB 343 Genetic Engineering and Society. (4)
fall
Introduction to genetic engineering, with emphasis on applications (gene therapy, DNA fingerprinting, bioremediation, transgenic animals and plants). 3 hours lecture, 3 hours lab. Cross-listed as BIO 343.
Credit is allowed for only BIO 343 or MBB 343. Prerequisites: preferably both MBB 245 and 246 or only BIO 181 (or its equivalent).
General Studies: L

MBB 350 Applied Genetics. (4)
spring
Introduction to molecular genetics with emphasis on application of genetics in solving biological questions and engineering organisms in biotechnology. 2 hours lecture, 6 hours lab. Cross-listed as PLB 350.
Credit is allowed for only MBB 350 or PLB 350. Prerequisites: preferably both MBB 245 and 246 or only BIO 181 (or its equivalent).

MBB 445 Techniques in Molecular Biology/Genetics. (2)
fall and spring
Molecular genetic principles: plasmid construction, purification, and characterization; PCR; mutageneses; hybridization and sequence analysis; protein quantitation, immunologic detection, and electrophoresis. Cross-listed as MBB 445. Credit is allowed for only MBB 445 or MIC 445. Prerequisites: both BIO 340 and MIC 302 or only instructor approval.

MBB 446 Techniques in Molecular Biology/Genetics Lab. (2)
fall and spring
Molecular genetic techniques: plasmid construction, purification, and characterization; PCR; mutageneses; hybridization and sequence analysis; protein quantitation; immunologic detection and electrophoresis. Cross-listed as MIC 446. Credit is allowed for only MBB 446 or MIC 446. Pre- or corequisite: MBB 445 or MIC 445.

MBB 484 Internship. (3)
not regularly offered

MBB 490 Capstone: Issues in Biotechnology. (2)
fall and spring
Integration of science and humanities within problem-solving exercises dealing with intellectual property, ethics, regulatory issues, business practices, and commercialization. Prerequisite: Molecular Biosciences/Biotechnology major or instructor approval.

MBB 499 Individualized Instruction. (3)
not regularly offered

ASU staff member Christi Roger creates glassware for use in chemistry classes. Tim Trumble photo
DEPARTMENT OF PHILOSOPHY

Department of Philosophy
Brad Armendt
Chair
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ASSISTANT PROFESSORS
DEVLIN, MASON

LECTURER
BOLTON

PHILOSOPHY—B.A.

The major in Philosophy consists of 45 semester hours, 33 of which must be upper-division hours. In addition to the 45 semester hours, the mathematics proficiency requirement must be met by completing MAT 117 or higher. In exceptional cases, up to nine semester hours may be in related fields as approved by the undergraduate advisor. Required courses are as follows:

- PHI 300 Philosophical Argument and Exposition L ............3
- PHI 301 History of Ancient Philosophy HU, H .............3
- PHI 302 History of Modern Philosophy HU, H ..........3
- PHI 305 Ethical Theory HU .......................................3
- or PHI 335 History of Ethics HU (3)
- PHI 312 Theory of Knowledge HU ................................3
- or PHI 314 Philosophy of Science HU (3)
- PHI 316 Metaphysics HU .............................................3
- or PHI 317 Philosophy of Mind HU (3)
- PHI 333 Introduction to Symbolic Logic ....................3

Choose two courses below ...........................................6

- PHI 401 Rationalism (3)
- PHI 402 Empiricism HU (3)
- PHI 403 Contemporary Analytic Philosophy HU (3)
- PHI 413 Advanced Symbolic Logic (3)
- PHI 420 Topics in Philosophy (3)
- PHI 494 Special Topics (3)

Total .............................................................................27

Exceptions by special permission of the chair only. PHI 420 may be repeated for credit.

Students planning to do graduate work in philosophy should consult with an advisor to develop an appropriate selection of courses at the 300 and 400 levels. A minimum grade of “C” is necessary for each course used to fulfill the major requirements. See “College Degree Requirements,” page 319.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

History and Philosophy of Science. The faculty in the Department of Philosophy offer courses bearing the HPS prefix. With the consent of the director of undergraduate studies, these courses may be taken to satisfy the requirements of the Philosophy major.

MINOR IN PHILOSOPHY

A minor in Philosophy consists of 18 semester hours, of which at least 12 must be in the upper division and approved by an advisor in the department. All courses must be passed with a minimum grade of “C.”

CERTIFICATE IN ETHICS

The Ethics Certificate consists of 18 semester hours approved by an advisor in the department. The student must take PHI 305 or 335. At least 15 hours must be chosen from PHI 105, 304, 305, 306, 307, 309, 310, 335, and (when its topic is within ethics) PHI 420. One course outside this list, and perhaps outside the department, may be used with written approval from the Director of Undergraduate Studies. All courses must be passed with a minimum grade of “C.”

CERTIFICATE IN HISTORY AND PHILOSOPHY OF SCIENCE

The History and Philosophy of Science Certificate consists of 18 semester hours, of which at least 12 must be in the upper division and approved by an advisor in the department. At least nine semester hours must be HPS, and three semester hours must be PHI 314 Philosophy of Science. All courses must be passed with a minimum grade of “C.”

GRADUATE PROGRAM

The faculty in the Department of Philosophy offer a graduate program leading to the M.A. and Ph.D. degrees. See the Graduate Catalog for requirements.

HISTORY AND PHILOSOPHY OF SCIENCE (HPS)

HPS 311 Origins, Evolution, and Creation. (3)
not regularly offered
Examines scientific, mythic, and religious ideas relating to origins (particularly human). Place of antievolutionism and “scientific creationism” in American culture. Lecture, discussion. Cross-listed as BIO 344/ HUM 371/REL 383. Credit is allowed for only BIO 344 or HPS 311 or HUM 371 or REL 383.

HPS 322 History of Science. (3)
once a year
Development and application of scientific thinking from ancient times through the 17th century.
General Studies: HU, H

HPS 323 History of Science. (3)
not regularly offered
Development and application of scientific thinking from the 18th century to the present.
General Studies: HU, H

HPS 325 Chinese Science and Medicine. (3)
not regularly offered
Explores development of Chinese traditions dealing with the natural world, science, and medicine. Lecture, discussion. Cross-listed as HST 385. Credit is allowed for only HPS 325 or HST 385.
General Studies: HU, G, H
PHI 305 Ethical Theory. (3)
Once a year
Current theories about the nature of morality (metaethics) and about what is right and wrong (normative ethics). Prerequisite: PHI 105 or 306 or 307 or 309 or 335 or instructor approval.
General Studies: HU

PHI 306 Applied Ethics. (3)
Fall, spring, summer
Philosophical discussion of contemporary moral and political issues, such as abortion, euthanasia, animal rights, affirmative action, and sexual rights.
General Studies: HU

PHI 307 Philosophy of Law. (3)
Once a year
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, and differences between theories of natural and positive law.
General Studies: HU

PHI 308 Philosophy of Art. (3)
Once a year
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, and objectivity and relativity in art criticism.
General Studies: HU

PHI 309 Social and Political Philosophy. (3)
Once a year
Alternative principles and methods relevant to problems of human association and conflict; discusses justice and power, freedom and equality, and autonomy and order. Prerequisite: PHI 105 or 305 or 335 or instructor approval.
General Studies: HU

PHI 310 Environmental Ethics. (3)
Once a year
Examines a full range of philosophical positions pertaining to our moral relationship to the natural world; anthropocentrism, individualism, biocentrism.
General Studies: HU

PHI 311 Philosophy in Literature. (3)
Once a year
Selected works of literature introduce philosophical problems such as the nature of moral goodness and people’s relation to the world and other people.
General Studies: HU

PHI 312 Theory of Knowledge. (3)
Once a year
Nature, sources, and limits of human knowledge. Topics may include truth, a priori knowledge, empirical knowledge, perception, induction, and skepticism. Prerequisite: PHI 101 or 103 or 300 or 301 or 302 or 333.
General Studies: HU

PHI 314 Philosophy of Science. (3)
Once a year
Structure and justification of scientific theories, explanation, and theory change. Roles of observation and laws, theoretical concepts and entities, reduction, probability, confirmation, space and time, and causation.
General Studies: HU

PHI 315 Philosophy of Language. (3)
Once a year
Problems pertaining to the nature of language, including meaning, reference, truth, definition, analyticity, translatability, synonymy, and contributions of contemporary linguistics. Prerequisite: PHI 103 or 300 or 333.
General Studies: HU

PHI 316 Metaphysics. (3)
Once a year
Problems pertaining to the nature of reality. Topics may include nature of person, minds, substance, universals, space, time, causation, and modality. Prerequisite: PHI 101 or 103 or 300 or 301 or 333.
General Studies: HU
PHI 317 Philosophy of Mind. (3)  
*once a year*
Nature of consciousness. Common sense view of mind, behaviorism, materialism, dualism, functionalism, self-knowledge, and knowledge of other minds. Prerequisite: PHI 101 or 103 or 300 or 301 or 302 or 333.
*General Studies: HU*

PHI 318 Philosophy of Religion. (3)  
*once a year*
Classical arguments for the existence of God. Argument from evil against the existence of God. Justification of religious belief.
*General Studies: HU*

PHI 319 Philosophy of Computing. (3)  
*not regularly offered*
Philosophical problems surrounding the theory of computation. Turing machines, mind and AI, neural network computing, ethics, and epistemology of computing. Lecture, lab, discussion.
*General Studies: CS/HU*

PHI 325 Philosophy of Social Science. (3)  
*not regularly offered*
Philosophical problems surrounding the aims, structure, and methods of the social sciences.
*General Studies: HU/SB*

PHI 332 19th-Century Philosophy. (3)  
*not regularly offered*
History of 19th-century philosophical thought, emphasizing either the German or the British traditions. Prerequisite: PHI 302.
*General Studies: HU*

PHI 333 Introduction to Symbolic Logic. (3)  
*once a year*
Symbolic techniques, emphasizing deductions and proofs in the propositional and 1st-order predicate calculi.

PHI 335 History of Ethics. (3)  
*once a year*
Major works of moral philosophy, both ancient and modern, such as those by Plato, Aristotle, Hobbes, Hume, Kant, and Mill. Prerequisite: PHI 101 or 105 or 305 or 306 or 307 or 309 or instructor approval.
*General Studies: HU*

PHI 401 Rationalism. (3)  
*not regularly offered*
Examines classical philosophical rationalism, as in Descartes, Spinoza, Malebranche, or Leibniz. Contemporary rationalist thought may also be examined. Prerequisites: PHI 302 and 305 (or 309 or 312 or 316 or 317).

PHI 402 Empiricism. (3)  
*not regularly offered*
Examines representatives of either classical or contemporary philosophical empiricism, e.g., Bacon, Hobbes, Locke, Butler, Berkeley, Reid, Hume, Mill, Carnap, and Ayer. Prerequisites: PHI 302 and 305 (or 309 or 312 or 316 or 317).
*General Studies: HU*

PHI 403 Contemporary Analytic Philosophy. (3)  
*once a year*
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. Prerequisites: PHI 302 and 312 (or 314 or 315 or 316 or 317 or 401 or 402).
*General Studies: HU*

PHI 413 Advanced Symbolic Logic. (3)  
*not regularly offered*
Properties of formal systems axiomatizing propositional and 1st-order predicate logic. May also include modal logic, number theory, and limits of logicism. Prerequisite: PHI 333.

PHI 420 Topics in Philosophy. (3)  
*once a year*
Course descriptions on file in department. May be repeated for credit. Possible topics:
(a) History of Philosophy
(b) Metaphysics/Epistemology
(c) Philosophy of Language/Logic
(d) Philosophy of Science
(e) Value Theory
Prerequisite: one relevant upper-division PHI course or instructor approval.

PHI 494 Special Topics. (3)  
*not regularly offered*

PHI 590 Reading and Conference. (1–12)  
*not regularly offered*

PHI 591 Seminar. (1–12)  
*once a year*
Possible topics:
(a) Aesthetics. (1–3)
(b) Epistemology. (1–3)
(c) Ethics. (1–3)
(d) History of Philosophy. (1–3)
(e) Logic. (1–3)
(f) Metaphysics. (1–3)
(g) Philosophy of Language. (1–3)
(h) Philosophy of Law. (1–3)
(i) Philosophy of Science. (1–3)
(j) Social and Political Philosophy. (1–3)

PHI 592 Research. (1–15)  
*not regularly offered*

PHI 599 Thesis. (1–12)  
*fall and spring*

PHI 790 Reading and Conference. (1–12)  
*not regularly offered*

PHI 792 Research. (1–15)  
*not regularly offered*

PHI 798 Dissertation. (1–15)  
*not regularly offered*
### Department of Physics and Astronomy

Barry G. Ritchie  
Chair  
(PS F470) 480/965-3561  
phy.asu.edu

#### REGENTS’ PROFESSORS
SMITH, SPENCE

#### PROFESSORS
ALARCON, BAUER, BENNETT, BURSTEIN, CHAMBERLIN, COMFORT, COWLEY, DOAK, DOW, HESTER, JACOB, KAUFMANN, LINDSAY, MENENDEZ, PAGE, PONCE, REZ, RITCHIE, SANKEY, SCHEINFEIN, SCHMIDT, STARRFIELD, TILLERY, TSENG, TSONG, VENABLES, WINDHORST, WYCKOFF

#### ASSOCIATE PROFESSORS
AANNESTAD, ACHARYA, BENIN, CULBERTSON, DRUCKER, HERBOTS, MARZKE

#### ASSISTANT PROFESSOR
LEBED

### PHYSICS—B.S.

Students majoring in Physics may pursue one of two options.

**Option I.** Designed for students who wish to pursue physics at the bachelor or graduate degree levels, option I consists of the following required courses:

Choose between the course combinations below............. 4

<table>
<thead>
<tr>
<th>Course Combination</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 121 University Physics I: Mechanics $S Q^1$</td>
<td>3</td>
</tr>
<tr>
<td>PHY 122 University Physics Laboratory I $S Q^1$</td>
<td>1</td>
</tr>
<tr>
<td>PHY 151 Physics II $S Q^4$</td>
<td>4</td>
</tr>
<tr>
<td>PHY 131 University Physics II: Electricity and Magnetism $S Q^2$</td>
<td>3</td>
</tr>
<tr>
<td>PHY 132 University Physics Laboratory II $S Q^2$</td>
<td>1</td>
</tr>
</tbody>
</table>

Choose between the course combinations below............. 4

<table>
<thead>
<tr>
<th>Course Combination</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 201 Mathematical Methods in Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 252 Physics III $S Q$</td>
<td>4</td>
</tr>
<tr>
<td>PHY 302 Mathematical Methods in Physics II</td>
<td>2</td>
</tr>
<tr>
<td>PHY 310 Classical Particles, Fields, and Matter I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 311 Classical Particles, Fields, and Matter II</td>
<td>3</td>
</tr>
<tr>
<td>PHY 314 Quantum Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 315 Quantum Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHY 333 Electronic Circuits and Measurements</td>
<td>3</td>
</tr>
<tr>
<td>PHY 416 Quantum Physics III</td>
<td>3</td>
</tr>
<tr>
<td>PHY 441 Statistical and Thermal Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 465 Advanced Laboratory II</td>
<td>2</td>
</tr>
</tbody>
</table>

Total ................. 45

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#### Supporting mathematics courses are as follows:

<table>
<thead>
<tr>
<th>Course Combination</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 270 Calculus with Analytic Geometry I $MA$</td>
<td>4</td>
</tr>
<tr>
<td>MAT 271 Calculus with Analytic Geometry II $MA$</td>
<td>4</td>
</tr>
<tr>
<td>MAT 272 Calculus with Analytic Geometry III $MA$</td>
<td>4</td>
</tr>
</tbody>
</table>

Additional courses in physics and related fields are selected with the approval of the advisor. French, German, or Russian is strongly recommended to fulfill the foreign language requirement.

**Option II.** The interdisciplinary option II is designed for students who wish to obtain an undergraduate physics preparation for entry into other professions or graduate programs. A total of 53 hours are required, including the following courses:

Choose between the course combinations below............. 4

<table>
<thead>
<tr>
<th>Course Combination</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 121 University Physics I: Mechanics $S Q^1$</td>
<td>3</td>
</tr>
<tr>
<td>PHY 122 University Physics Laboratory I $S Q^1$</td>
<td>1</td>
</tr>
<tr>
<td>PHY 151 Physics II $S Q^4$</td>
<td>4</td>
</tr>
</tbody>
</table>

Choose between the course combinations below............. 4

<table>
<thead>
<tr>
<th>Course Combination</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 301 Mathematical Methods in Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 302 Mathematical Methods in Physics II</td>
<td>2</td>
</tr>
<tr>
<td>PHY 310 Classical Particles, Fields, and Matter I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 311 Classical Particles, Fields, and Matter II</td>
<td>3</td>
</tr>
<tr>
<td>PHY 314 Quantum Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 315 Quantum Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHY 333 Electronic Circuits and Measurements</td>
<td>3</td>
</tr>
<tr>
<td>PHY 412 Classical Particles, Fields, and Matter III</td>
<td>2</td>
</tr>
<tr>
<td>PHY 416 Quantum Physics III</td>
<td>3</td>
</tr>
<tr>
<td>PHY 441 Statistical and Thermal Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 465 Advanced Laboratory II</td>
<td>2</td>
</tr>
</tbody>
</table>

Total ................. 40

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1 Both PHY 121 and 122 must be taken to secure SQ credit.

2 Both PHY 131 and 132 must be taken to secure SQ credit.

#### Emphasis in Astronomy

The astronomy faculty offer courses in astronomy both for nonscience majors and for science and physics majors.
For an emphasis in astronomy, the following courses (or their equivalents) should be taken:

AST 321 Introduction to Planetary and Stellar Astrophysics SQ1 ..................................................3
AST 322 Introduction to Galactic and Extragalactic Astrophysics SQ2 ..................................................3
AST 421 Astrophysics I ...........................................................3
AST 422 Astrophysics II ...........................................................3
AST 499 Individualized Instruction ...........................................................3

Total ........................................................................................................ 15

1 Both AST 113 and 321 must be taken to secure SQ credit.
2 Both AST 114 and 322 must be taken to secure SQ credit.

MINOR IN ASTRONOMY

The minor in Astronomy consists of a minimum of 24 semester hours. Required courses are as follows:

AST 113 Astronomy Laboratory I SQ1 ..................................................1
AST 114 Astronomy Laboratory II SQ2 ..................................................1
AST 321 Introduction to Planetary and Stellar Astrophysics SQ1 ..................................................3
AST 322 Introduction to Galactic and Extragalactic Astrophysics SQ2 ..................................................3

Choose between the course combinations below ........................................ 4

PHY 150 Physics I SQ (4)

——— or ———

PHY 121 University Physics I: Mechanics SQ1 (3)
PHY 122 University Physics Laboratory I SQ2 (1)

Choose between the course combinations below ........................................ 4

PHY 151 Physics II SQ (4)

——— or ———

PHY 131 University Physics II: Electricity and Magnetism SQ3 (3)
PHY 132 University Physics Laboratory II SQ4 (1)
PHY 252 Physics III SQ ............................................................. 4

Approved upper-division electives .......................................................... 4

Total ........................................................................................................ 24

1 Both AST 113 and 321 must be taken to secure SQ credit.
2 Both AST 114 and 322 must be taken to secure SQ credit.
3 Both PHY 121 and 122 must be taken to secure SQ credit.
4 Both PHY 131 and 132 must be taken to secure SQ credit.

Electives are chosen with the approval of an astronomy advisor from upper-division courses in physics and astronomy.

MINOR IN PHYSICS

The minor in Physics consists of a minimum of 29 semester hours. Required courses are as follows:

Choose between the course combinations below ........................................ 4

PHY 150 Physics I SQ (4)

——— or ———

PHY 121 University Physics I: Mechanics SQ1 (3)
PHY 122 University Physics Laboratory I SQ2 (1)

Choose between the course combinations below ........................................ 4

PHY 151 Physics II SQ (4)

——— or ———

PHY 131 University Physics II: Electricity and Magnetism SQ3 (3)
PHY 132 University Physics Laboratory II SQ4 (1)
PHY 252 Physics III SQ ............................................................. 4

Approved upper-division electives .......................................................... 4

Total ........................................................................................................ 29

1 Both PHY 121 and 122 must be taken to secure SQ credit.
2 Both PHY 131 and 132 must be taken to secure SQ credit.

Electives are chosen with the approval of the physics advisor from upper-division courses in physics and astronomy.

SECONDARY EDUCATION—B.A.E.

Physics. Two options are available for physics as the major teaching field.

Option One. The major teaching field consists of 42 semester hours. Required courses are as follows:

Choose between the course combinations below ........................................ 4

PHY 150 Physics I SQ1 (4)

——— or ———

PHY 121 University Physics I: Mechanics SQ2 (3)
PHY 122 University Physics Laboratory I SQ3 (1)

Choose between the course combinations below ........................................ 4

PHY 151 Physics II SQ1 (4)

——— or ———

PHY 131 University Physics II: Electricity and Magnetism SQ4 (3)
PHY 132 University Physics Laboratory II SQ5 (1)
PHY 252 Physics III SQ ............................................................. 4

Approved upper-division electives .......................................................... 4

Total ........................................................................................................ 42

1 Both PHY 111, 112, 113, and 114 or equivalents may be substituted for PHY 150, 151, and 252 with approval of the advisor.
2 Both PHY 121 and 122 must be taken to secure SQ credit.
3 Both PHY 131 and 132 must be taken to secure SQ credit.

Electives are chosen in physics or other closely related fields, subject to the approval of the advisor.

Option Two. Option two consists of 32 semester hours in physics and an additional 30 semester hours in chemistry (see “Minor in Chemistry,” page 347) or mathematics (see “Minor in Mathematics,” page 404). The physics portion of this program requires the following courses:

PHY 131 University Physics II: Electricity and Magnetism SQ2 (3)
PHY 132 University Physics Laboratory II SQ3 (1)
PHY 201 Mathematical Methods in Physics I ................................................. 3
PHY 252 Physics III SQ ............................................................. 4
PHY 302 Mathematical Methods in Physics II ............................................. 2
PHY 310 Classical Particles, Fields, and Matter I ........................................ 3
PHY 311 Classical Particles, Fields, and Matter II ....................................... 3
PHY 333 Electronic Circuits and Measurements ........................................ 3
PHY 361 Introductory Modern Physics ....................................................... 3

or PHY 314 Quantum Physics I ......................................................... 3

PHY 480 Methods of Teaching Physics ...................................................... 3

or PHY 484 Internship: Physics Teaching (1–4)

Approved electives ............................................................. 10

Total ........................................................................................................ 42

1 Both PHY 121 and 122 must be taken to secure SQ credit.
2 Both PHY 131 and 132 must be taken to secure SQ credit.

Electives are chosen in physics or other closely related fields, subject to the approval of the advisor.
Choose between the course combinations below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 150</td>
<td>Physics I SQ(^1)</td>
<td>4</td>
</tr>
<tr>
<td>PHY 121</td>
<td>University Physics I: Mechanics SQ(^2)</td>
<td>3</td>
</tr>
<tr>
<td>PHY 122</td>
<td>University Physics Laboratory I SQ(^2)</td>
<td>1</td>
</tr>
</tbody>
</table>

Total: 32 units

---

1. Both PHY 150 and PHY 121 or PHY 122 can be taken to secure SQ credit.
2. Both PHY 121 and PHY 122 must be taken to secure SQ credit.
3. Both PHY 131 and PHY 132 must be taken to secure SQ credit.
4. PHY/Physics option: MAT 274 plus MAT 342 may be substituted for PHY 201.
5. PHY/Physics/Chemistry option: CHM 480 may be substituted for PHY 480.

**Minor Teaching Field.** The minor teaching field consists of 24 semester hours. Required courses are as follows:

Choose between the course combinations below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 150</td>
<td>Physics I SQ(^1)</td>
<td>4</td>
</tr>
<tr>
<td>PHY 121</td>
<td>University Physics I: Mechanics SQ(^2)</td>
<td>3</td>
</tr>
<tr>
<td>PHY 122</td>
<td>University Physics Laboratory I SQ(^2)</td>
<td>1</td>
</tr>
</tbody>
</table>

Total: 24 units

---

1. PHY 111, 112, 113, and 114 or equivalents may be substituted for PHY 150, 151, and 252 with approval of the advisor.
2. Both PHY 121 and 122 must be taken to secure SQ credit.
3. Both PHY 131 and 132 must be taken to secure SQ credit.
4. Physics/Math option: MAT 274 plus MAT 342 may be substituted for PHY 201.
5. Physics/Chemistry option: CHM 480 may be substituted for PHY 480.

**Graduate Programs**

The faculty in the Department of Physics and Astronomy offer programs leading to the degrees of Master of Natural Science, M.S., and Ph.D. See the Graduate Catalog for requirements.

**Astronomy (AST)**

**AST 111 Introduction to Solar Systems Astronomy. (3)**

- History, properties of light, instruments, study of the solar system and nearby stars. For non-science majors. Optional lab (AST 113).
- General Studies: SQ (if credit also earned in AST 113)

**AST 112 Introduction to Stars, Galaxies, and Cosmology. (3)**

- Structure and evolution of stars, star clusters, galaxies, cosmology. For non-science majors. Optional lab (AST 114).
- General Studies: SQ (if credit also earned in AST 114)

**AST 113 Astronomy Laboratory I. (1)**

- Astronomical observations and experiments designed to help the student become familiar with the sky, telescopes, and astronomical measurements. 2.5 hours lab. Pre- or corequisites: AST 111 (or 321); a working knowledge of high school algebra and geometry.
- General Studies: SQ (if credit also earned in AST 111 or 321)

**AST 114 Astronomy Laboratory II. (1)**

- Similar to AST 113, but material chosen to supplement AST 112 and 322. 2.5 hours lab. Pre- or corequisites: AST 112 (or 322); a working knowledge of high school algebra and geometry.
- General Studies: SQ (if credit also earned in AST 112 or 322)

**AST 321 Introduction to Planetary and Stellar Astrophysics. (3)**

- Physical laws; celestial mechanics; properties of planets, sun, and other stars; formation and evolution of stars and planetary systems.
- Prerequisites: MAT 270 (or 290); PHY 150.
- General Studies: SQ (if credit also earned in AST 113)

**AST 322 Introduction to Galactic and Extragalactic Astrophysics. (3)**

- Evolved stars, introduction to relativity, galaxies and interstellar matter, structure and dynamics of galaxies, cosmology.
- Prerequisite: AST 321 or instructor approval.
- General Studies: SQ (if credit also earned in AST 114)

**AST 421 Astrophysics I. (3)**

- Selected astrophysical topics, including: stellar evolution, star formation, interstellar medium, galactic structure, extragalactic astronomy, high-energy astrophysics, and cosmology.
- Prerequisites: AST 321, 322; PHY 311, 314.

**AST 422 Astrophysics II. (3)**

- Same range of astrophysical topics as for AST 421 but different specific topics are emphasized in a given year.
- Prerequisites: AST 321, 322; PHY 311, 314.

**AST 499 Individualized Instruction. (3)**

- not regularly offered

**AST 598 Special Topics. (1–4)**

- not regularly offered

Possible topics:
- (a) Astronomical Data Taking and Data Reduction
- (b) Cosmology and High-Energy Astrophysics
- (c) Extragalactic Astronomy
- (d) Galactic Structure
- (e) Interstellar Medium and Gaseous Astrophysics
- (f) Stellar Interiors and Stellar Evolution

**Physical Sciences (PHS)**

**PHS 110 Fundamentals of Physical Science. (4)**

- One-semester survey of the principles of physics and chemistry. Presumes understanding of elementary algebra. 3 hours lecture, 2 hours lab.
- General Studies: SQ
PHS 208 Patterns in Nature. (4)  
fall and spring  
Project-oriented science course with computer training to develop critical thinking and technical skills for student-oriented science lessons K–12. Lecture, lab. Cross-listed as STE 208. Credit is allowed for only PHS 208 or STE 208. Prerequisite: college-level science course or instructor approval.  
General Studies: SQ  

PHS 484 Physical Science Internship. (3)  
fall and spring  
Applies scientific concepts discussed and demonstrated in PHS 208 to teach middle school students. Hands-on experience is the focus of the teaching.  

PHS 505 Energy and the Environment. (3)  
summer  
Current problems in energy resources, production, consumption, and conservation. Studio. Prerequisite: instructor approval.  

PHS 510 Inquiry Physical Science I. (3)  
summer  
Inquiry approach to physical science, standards-based, intended for elementary school teachers. Topics selected: kinematics, dynamics, electricity, magnetism, light, astronomy. Studio. Prerequisite: instructor approval.  

PHS 520 Inquiry Physical Science II. (3)  
summer  
Inquiry approach to physics and astronomy, standards-based, intended for middle school teachers. Emphasizes technology and modeling. Studio. Prerequisite: instructor approval.  

PHS 530 Methods of Physics Teaching I. (3)  
summer  
Inquiry approach to high school physics teaching. Studio. Prerequisite: instructor approval.  

PHS 531 Methods of Physics Teaching II. (3)  
summer  
Extension of modeling techniques introduced in PHY 580. Studio. Prerequisite: PHS 530 or instructor approval.  

PHS 534 Methods of Teaching Physical Science I, II, III. (3)  
summer  
Design of curriculum and conduct of instruction for physical science courses. Studio. Prerequisite: instructor approval.  

PHS 540 Integrated Physics and Chemistry. (3)  
summer  
Collaborative inquiry methods for teaching and coordinating physics and chemistry. Studio. Prerequisite: CHM 480 or PHS 530 or PHY 480 or instructor approval.  

PHS 542 Integrated Mathematics and Physics. (3)  
summer  
Mathematical models and modeling as an integrating theme for secondary mathematics and physics. Studio. Prerequisite: instructor approval.  

PHS 550 Physics and Astronomy. (3)  
summer  
Astronomy curricula and projects for secondary school, with emphasis on the role of physics in astronomy. Studio. Prerequisite: instructor approval.  

PHS 556 Astrophysics. (3)  
summer  
Structure and evolution of stars, galaxies, and the universe. For secondary school teachers. Studio. Prerequisite: instructor approval.  

PHS 560 Matter and Light. (3)  
summer  
Interactions of light with matter. Lasers and spectroscopy. Studio. Prerequisite: instructor approval.  

PHS 564 Light and Electron Optics. (3)  
summer  
Principles and practice of electron-optical instruments. Studio. Prerequisite: instructor approval.  

PHS 570 Spacetime Physics. (3)  
summer  
Special and general theories of relativity with implications for space and time travel. Studio. Prerequisite: instructor approval.  

PHS 581 Structure of Matter and Its Properties. (3)  
summer  
Models of matter and its properties. Studio. Prerequisite: instructor approval.  

PHYSICS (PHY)  

PHY 101 Introduction to Physics. (4)  
fall and spring  
Emphasizes applications of physics to life in the modern world. Presumes understanding of elementary algebra. 3 hours lecture, 1 recitation, 2 hours lab.  
General Studies: SQ  

PHY 105 Basic Physics. (3)  
tall  
One-semester survey of the principles of physics. Primarily for students who intend to take PHY 121, 131 but have not taken high school physics. 3 hours lecture, 1 recitation. Prerequisites: algebra and trigonometry.  

PHY 111 General Physics. (3)  
fall, spring, summer  
Noncalculus treatment of the principles of physics for non-physics majors. Students whose curricula require a laboratory course must also register for PHY 113. 3 hours lecture, 1 recitation. Prerequisite: trigonometry.  
General Studies: SQ (if credit also earned in PHY 113)  

PHY 112 General Physics. (3)  
fall, spring, summer  
Continuation of PHY 111. Students whose curricula require a laboratory course must also register for PHY 114. Prerequisite: PHY 111.  
General Studies: SQ (if credit also earned in PHY 114)  

PHY 113 General Physics Laboratory. (1)  
tall, spring, summer  
Elementary experiments in physics. 2 hours lab. Requires outside preparation for experiments and report writing. May be taken concurrently with, or subsequent to, PHY 111.  
General Studies: SQ (if credit also earned in PHY 111)  

PHY 114 General Physics Laboratory. (1)  
tall, spring, summer  
See PHY 113. May be taken concurrently with, or subsequent to, PHY 112.  
General Studies: SQ (if credit also earned in PHY 112)  

PHY 121 University Physics I: Mechanics. (3)  
tall, spring, summer  
Kinematics, Newton’s laws; work, energy, momentum, conservation laws; dynamics of particles, solids, and fluids. 3 hours lecture, 1 hour recitation. Prerequisite: MAT 270 or 280 or instructor approval.  
General Studies: SQ (if credit also earned in PHY 122)  

PHY 122 University Physics Laboratory I. (1)  
tall, spring, summer  
Lab accompanying PHY 121. Prerequisite/corequisite: PHY 121.  
General Studies: SQ (if credit also earned in PHY 121)  

PHY 131 University Physics II: Electricity and Magnetism. (3)  
tall, spring, summer  
Electric charge and current, electric and magnetic fields in vacuum and in materials, and induction. AC circuits, displacement current, and electromagnetic waves. 3 hours lecture, 1 hour recitation. Prerequisites: MAT 271 or 291 or instructor approval). PHY 121. Corequisite: MAT 272 or instructor approval.  
General Studies: SQ (if credit also earned in PHY 132)  

PHY 132 University Physics Laboratory II. (1)  
spring and summer  
Lab accompanying PHY 131. Prerequisite/corequisite: PHY 131.  
General Studies: SQ (if credit also earned in PHY 131)  

PHY 150 Physics I. (4)  
spring  
Introductory physics for majors. Kinematics, Newton’s Laws, basic forces, energy, momentum, special relativity. 3 hours lecture, 3 hours lab. Prerequisite: MAT 270 or 290 (or its equivalent).  
General Studies: SQ
PHY 151 Physics II (4)  
fall  
Continuation of PHY 150. Electromagnetic fields; Ampere's and Faraday's Laws; Maxwell's equations; basic circuit elements. 3 hours lecture, 3 hours lab. Prerequisites: MAT 271 (or 291 or its equivalent); PHY 121, 122 (or 150).  
General Studies: SQ

PHY 190 Seminar: Physics as a Curriculum and a Profession. (1)  
fall and spring  

PHY 201 Mathematical Methods in Physics I. (3)  
spring  
Differential equations, linear equations, vectors, matrices, Fourier series, and numerical methods. 2 hours lecture, 2 hours lab. Prerequisite: PHY 127 or (or its equivalent). Corequisite: PHY 125.

PHY 241 University Physics III. (3)  
fall and spring  
Thermodynamics, kinetic theory, physical and wave optics, relativity, photons, matter waves, atomic physics. 3 hours lecture, 1 hour recitation. Prerequisites: PHY 131; nonmajor.

PHY 252 Physics Ill. (4)  
spring  
Continuation of PHY 151. Wave physics, oscillations, harmonic systems, physical optics, thermodynamics, kinetic theory. 3 hours lecture, 3 hours lab. Prerequisites: PHY 127 (or 151 or its equivalent). Corequisite: PHY 252.

PHY 252 Physics Ill. (4)  
spring  
Continuation of PHY 151. Wave physics, oscillations, harmonic systems, physical optics, thermodynamics, kinetic theory. 3 hours lecture, 3 hours lab. Prerequisites: PHY 127 (or 151 or its equivalent). Corequisite: PHY 252.

PHY 302 Mathematical Methods in Physics II. (2)  
fall  
Continuation of PHY 201. Vector calculus, complex variables, partial differential equations, special functions, numerical methods. 1 hour lecture, 3 hours lab. Prerequisite: PHY 201 (or its equivalent).

PHY 310 Classical Particles, Fields, and Matter I. (3)  
fall  
Particle kinematics, mechanics, conservation laws, particle motion in force fields, dynamics of two-body systems, reference frames, rigid body motion, relativity. Corequisites: both PHY 302 and 314 or only instructor approval.

PHY 311 Classical Particles, Fields, and Matter II. (3)  
spring  
Electrostatic and gravitational fields, Poisson and Laplace equations, dielectric materials, magnetic fields and materials, magnetic induction, Faraday's Law. Prerequisites: PHY 302, 310. Corequisite: PHY 315 or instructor approval.

PHY 314 Quantum Physics I. (3)  
fall  
Photons, models of the atom, wave properties of matter, introduction to wave mechanics, 1-dimensional systems in quantum mechanics. Prerequisites: PHY 201 and 252 (or their equivalents). Corequisites: both PHY 302 and 310 or only instructor approval.

PHY 315 Quantum Physics II. (3)  
spring  
General principles of quantum mechanics, 3-dimensional problems, approximation methods, spin, introduction to many-particle systems. Prerequisites: PHY 302, 310, 314. Corequisite: PHY 311 or instructor approval.

PHY 333 Electronic Circuits and Measurements. (3)  
fall and spring  
Basic principles of electronic circuit analysis and measurement techniques using modern instrumentation and computer-aided analysis of data. 1 hour lecture, 3 hours lab; required equivalent effort outside of lab. Corequisite: PHY 201 or instructor approval.

PHY 334 Advanced Laboratory I. (2)  
spring  
Selected experiments from contemporary physics. Emphasis on modern instrumentation, computer-assisted acquisition and analysis of data, and report form writing. Lecture, lab. Prerequisites: PHY 310, 314, 333.

PHY 361 Introductory Modern Physics. (3)  
fall and spring  
Special relativity and introductory quantum theory with applications drawn from atomic, nuclear, and solid-state physics. 3 hours lecture, 1 recitation. Prerequisite: PHY 131.

PHY 412 Classical Particles, Fields, and Matter III. (3)  
fall  
Electromagnetic fields of moving charges, Maxwell's equations, harmonic phenomena, oscillations, waves, electromagnetic radiation, covariant electromagnetism, introduction to general relativity. Prerequisites: PHY 311, 333. Corequisite: PHY 416 or instructor approval.

PHY 416 Quantum Physics III. (3)  
fall  
Introduction to the quantum theory of atoms, molecules, solids and nuclei, Dirac's equation. Prerequisites: PHY 311, 315. Corequisite: PHY 412 or instructor approval.

PHY 420 Research Paper. (1)  
fall and spring  
Scientific report writing. Culminates in a paper based on library or laboratory research or both. Taken in conjunction with other courses as approved. Conference. Prerequisite: instructor approval.  
General Studies: L

PHY 441 Statistical and Thermal Physics I. (3)  
fall  

PHY 442 Statistical and Thermal Physics II. (3)  
spring  

PHY 452 Physical Optics. (3)  
fall  
Principles of reflection, refraction, diffraction. Additional topics from contemporary optics may include Fourier transform spectroscopy, linear systems theory, holography. 2 hours lecture, 2 hours lab. Prerequisites: PHY 302, 311, 315. Corequisite: PHY 412.

PHY 462 Nuclear and Particle Physics. (3)  
spring  
Static properties of nuclei, natural and induced radioactivity, nuclear reactions, nuclear models and energy levels, mesons and hyperons, and interaction of photons and electrons with matter. Prerequisites: PHY 311, 315.

PHY 465 Advanced Laboratory II. (2)  
fall and spring  
Continuation of PHY 334. Students are encouraged to substitute laboratory research project in consultation with faculty sponsor. Prerequisite: PHY 334.

PHY 466 Advanced Laboratory III. (1–3)  
fall and spring  
Continuation of PHY 465. Prerequisite: PHY 465.

PHY 480 Methods of Teaching Physics. (3)  
spring  
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.

PHY 481 Solid-State Physics. (3)  
spring  
Structure, elastic properties, and dynamics of crystals; electron motions in crystals under applied fields. Prerequisites: PHY 311, 315.

PHY 484 Internship: Physics Teaching. (1–4)  
fall, spring, summer  
Preparation for high school physics teaching. Student works closely with a faculty member in the elementary physics program. May be repeated for a total of 6 semester hours. Prerequisite: instructor approval.

PHY 495 Project Research. (1–3)  
fall and spring  
Supervised project in physics or astrophysics. May be repeated for credit. Prerequisite: instructor approval.

PHY 498 Pro-Seminar. (1–7)  
not regularly offered
PHY 501 Methods of Theoretical Physics. (3)  
fall and spring  
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.

PHY 502 Methods of Theoretical Physics. (3)  
fall and spring  
Continuation of PHY 501. Prerequisite: PHY 501.

PHY 521 Classical Mechanics. (3)  
fall  
Variational principles, Lagrange's and Hamilton's equations, rigid body  
motion, canonical transformations, Hamilton-Jacobi theory.

PHY 523 Relativity. (3)  
not regularly offered  
Special and general theories of relativity. Prerequisite: PHY 532 or  
instructor approval.

PHY 531 Advanced Electricity and Magnetism. (3)  
fall  
Electrostatics and magnetostatics; potential theory and theory of  
constitutive relations; Maxwell's equations; the wave equation, plane  
electromagnetic waves, cavities, and wave guides.

PHY 532 Electrodynamics. (3)  
spring  
Special theory of relativity, covariant formulation of electromagnetic  
interactions; inhomogeneous wave equations, Lienard-Wiechert  
potentials, and radiation fields; interactions of charged particles and  
electromagnetic waves, scattering, dispersion. Prerequisites: both  
PHY 412 and 531 or only instructor approval.

PHY 541 Statistical Physics. (3)  
fall  
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.

PHY 551 X-ray and Electron Diffraction. (3)  
spring  
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 microsc-  
opy/diffraction of crystalline/noncrystalline specimens. Prerequisite:  
PHY 481 or instructor approval.

PHY 556 Nuclear Physics. (3)  
fall and spring  
Two-nucleon interaction, Clebsch-Gordon coefficients, internucleon  
forces, meson theory and high-energy scattering, nuclear binding  
energy, nuclear models, transition probability estimates, nuclear reac-  
tions, and beta decay. Prerequisite: PHY 576 or instructor approval.

PHY 557 Quantum Physics. (3)  
spring  
Reviews modern physics, chemistry, math. Differential equation, oper-  
ator, matrix formulations. Free particle, bound-state problems. Examples  
across physics and astronomy. Prerequisites: a combination of  
modern physics and linear and complex algebra and differential equa-  
tions or only instructor approval.

PHY 576 Quantum Theory. (3)  
fall and spring  
Abstract approach to quantum mechanics in Hilbert space; observa-  
bles and their corresponding operators, eigenstates, and eigenval-  
ues; quantum dynamics; approximation methods; systems of identical  
particles; angular momentum and group representation theory; collision  
processes; relativistic quantum theory. Prerequisite: PHY 521.

PHY 577 Quantum Theory. (3)  
fall and spring  
Continuation of PHY 576. Prerequisite: PHY 576.

PHY 578 Relativistic Quantum Theory. (3)  
fall and spring  
Relativistic 1-particle equations, Klein-Gordon equation, Dirac equa-  
tion, 2D quantization, theory of scattering, S-matrix, Feynman diag-  
ams, quantum electrodynamics, and renormalization procedures.  
Prerequisite: PHY 577.

PHY 579 Relativistic Quantum Theory. (3)  
fall and spring  
Continuation of PHY 578. Prerequisite: PHY 578.

PHY 581 Solid-State Physics. (3)  
fall  
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  
corequisite: PHY 576.

PHY 582 Solid-State Physics. (3)  
spring  
Elements of transport theory, thermal conduction, electronic conduc-  
tion in metals, mobility in semiconductors, Hall effect, magnetoresis-  
tance, and selected topics of current research. Prerequisite: PHY 581.

PHY 587 Quantum Optics. (3)  
fall and spring  
Quantization of the electromagnetic field. Quantum theory of coherence,  
photon counting, photon states, lasers, density operators, and  
atomic Raman scattering. Prerequisite: PHY 576.

PHY 588 Quantum Optics. (3)  
fall and spring  
Continuation of PHY 587. Prerequisite: PHY 587.

PHY 592 Research. (1–12)  
not regularly offered  
Continuation of PHY 561. Prerequisite: PHY 561 or instructor  
approval.

PHY 598 Special Topics. (1–4)  
fall and spring  
Possible topics:  
(a) Quantum Mechanics. (3)  
spring  
(b) Quantum Physics. (3)  
spring

PHY 599 Thesis. (1–12)  
not regularly offered

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation  
requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed  
in this catalog, see "Classification of Courses," page 51.
PLANT BIOLOGY—B.S.

The Department of Plant Biology provides four curricular options to meet the needs of students whose interests are in rapidly expanding areas within the life sciences. Students may choose the general program option which allows the opportunity to develop strength in one area or discipline. Others may choose to design a more specific, but interdisciplinary, program in one of the following three optional concentrations: environmental science and ecology, plant biochemistry and molecular biology, and urban horticulture.

Each concentration promotes interaction between diverse groups and captures the growing interdisciplinary nature of scientific investigations. When one of these options is chosen, the title will appear on transcripts and other university documents.

The four curricular options prepare students for careers in technical, industrial, and educational fields as well as professional degree programs in medicine or research and postgraduate education in the life sciences.

The Department of Plant Biology, in cooperation with the Department of Microbiology, also administers the newly developed B.S. degree program in Molecular Biosciences/Biotechnology. This major is for students interested in molecular and cellular biology and its application to biotechnology. For more information about this area of study, see “Molecular Biosciences and Biotechnology,” page 415.

General Program

The B.S. degree in Plant Biology consists of a minimum of 38 semester hours in plant biology and approved related fields.

Additional life or physical science elective courses, totaling from 15 to 20 semester hours, are also required.

Required supplemental courses in chemistry are as follows:

- CHM 113 General Chemistry SQ* (4)
- CHM 115 General Chemistry with Qualitative Analysis SQ* (5)

Choose between the organic chemistry course combinations below: 4 or 8

- CHM 231 Elementary Organic Chemistry SQ* (3)
- CHM 235 Elementary Organic Chemistry Laboratory SQ* (1)

- CHM 331 General Organic Chemistry (3)
- CHM 332 General Organic Chemistry (3)
- CHM 335 General Organic Chemistry Laboratory (1)
- CHM 336 General Organic Chemistry Laboratory (1)

Total: 13 or 17

* Both CHM 231 and 235 must be taken to secure SQ credit.

Courses meeting the university mathematical studies requirement are as follows:

- MAT 251 Calculus for Life Sciences MA (3)
- PLB 430 Statistical Analyses in Environmental Science CS (3)
  or PLB 432 Computer Applications in Biology CS (3)
  or BIO 415 Biometry CS (4)

Special Concentration Programs

Three special concentration programs are optional. Students who wish to pursue the general program in Plant Biology are not obligated to choose one of these specific programs. Each special concentration program is expected to be interdisciplinary and contain course work outside both the department and the College of Liberal Arts and Sciences. Each concentration includes hands-on technical training.

Environmental Science and Ecology. The B.S. degree in Plant Biology concentrating in environmental science and ecology consists of a minimum of 44 semester hours in plant biology and approved related fields.

The required major courses are as follows:

- BIO 320 Fundamentals of Ecology SQ* (3)
- Choose between the geology course combinations below: 4 or 8
  - GLG 101 Introduction to Geology (Physical) SQ* G*1 (3)
  - GLG 103 Introduction to Geology I—Laboratory SQ* G*1 (1)

- GLG 110 Environmental Geology SG, G*2 (3)
- GLG 111 Environmental Geology Laboratory SG*2 (1)
- GLG 362 Geomorphology SQ* (3)
  or GLG 470 Hydrogeology (3)

- PLB 200 Biology of Plants SQ* (3)
PLB 201 Biology of Plants Laboratory SQ .................................1
PLB 310 The Flora of Arizona ..................................................4
PLB 322 Environmental Science (Major) .................................3
PLB 420 Plant Ecology: Organisms and Populations .................3
or PLB 421 Plant Ecology: Communities and Ecosystems (3)
PLB 484 Internship ................................................................3
or PLB 499 Individualized Instruction (3)

Total .....................................................................................27

1 Both CHM 231 and 235 must be taken to secure SQ credit.
2 Both MBB 245 and 246 must be taken to secure SQ credit.
3 Both PHY 111 and 113 must be taken to secure SQ credit.

Required supplemental courses in biology and chemistry are as follows:

CHM 113 General Chemistry SQ ..............................................4
CHM 115 General Chemistry with Qualitative Analysis SQ ......5
CHM 231 Elementory Organic Chemistry SQ* ......................3
CHM 235 Elementory Organic Chemistry Laboratory SQ* .........1

Total .....................................................................................13

* Both CHM 231 and 235 must be taken to secure SQ credit. Additional life or physical science elective courses, totaling 16 semester hours, are also required.

Courses meeting the university mathematical studies requirement are as follows:

MAT 251 Calculus for Life Sciences MA ...............................3
PLB 430 Statistical Analyses in Environmental Science CS ......3
or PLB 432 Computer Applications in Biology CS (3)

Plant Biochemistry and Molecular Biology. The B.S. degree in Plant Biology concentrating in biochemistry and molecular biology consists of 56 semester hours.

The required major courses are as follows:

BIO 353 Cell Biology ...............................................................3
PLB 308 Plant Physiology ......................................................4
PLB 350 Applied Genetics .....................................................4
PLB 444 Plant Growth and Development ..............................3
PLB 484 Internship ................................................................3
or PLB 499 Individualized Instruction (3)

Total .....................................................................................17

Additional life or physical science elective courses, totaling from 11 to 14 hours, are also required.

Required supplemental courses in biology, chemistry, and physics are as follows:

Choose between the course combinations below ....................4 or 9

BCH 361 Principles of Biochemistry (3)
BCH 367 Elementary Biochemistry Laboratory (1)

BCH 461 General Biochemistry (3)
BCH 462 General Biochemistry (3)
BCH 467 Analytical Biochemistry Laboratory L (3)

CHM 113 General Chemistry SQ ..............................................4
CHM 115 General Chemistry with Qualitative Analysis SQ ....5
CHM 231 Elementory Organic Chemistry SQ* ......................3
CHM 235 Elementory Organic Chemistry Laboratory SQ* .........1
MBB 245 Cellular and Molecular Biology SQ* .....................3
MBB 246 Cellular and Molecular Biology Laboratory SQ* .........1

PHY 111 General Physics SQ .................................................3
PHY 113 General Physics Laboratory I SQ* .........................1

Total .....................................................................................25 or 30

1 Both CHM 231 and 235 must be taken to secure SQ credit.
2 Both MBB 245 and 246 must be taken to secure SQ credit.
3 Both PHY 111 and 113 must be taken to secure SQ credit.

Urban Horticulture. The B.S. degree in Plant Biology concentrating in urban horticulture consists of a minimum of 46 semester hours in plant biology and approved related fields.

PLB 306 Plant Anatomy .........................................................4
or PLB 308 Plant Physiology (4)

PLB 414 Plant Pathology L ......................................................3

PLB 484 Internship ................................................................3

PLB 498 PS: Urban Horticulture .............................................1

Total .....................................................................................30–31

* Both PLB 200 and 201 must be taken to secure SQ credit.

Required supplemental courses in biology, chemistry, and soils are as follows:

CHM 101 Introductory Chemistry SQ ....................................4
CHM 231 Elementory Organic Chemistry SQ* ......................3
CHM 235 Elementory Organic Chemistry Laboratory SQ* .........1
Choose between the course combinations below ....................4

ERS 130 Introduction to Environmental Science SQ (4)

ERS 226 Soils (3)
ERS 226 Soils Laboratory (1)

Total .....................................................................................12

* Both CHM 231 and 235 must be taken to secure SQ credit. Additional elective courses from other disciplines, totaling seven to eight semester hours are also required. A total of 54 semester hours are required for this curricular option.

Courses meeting the university mathematical studies requirement are as follows:

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
PLB 430 Statistical Analyses in Environmental Science CS ........3
or PLB 432 Computer Applications in Biology CS (3)
or BIO 415 Biometry CS (4)
MAT 251 Calculus for Life Sciences MA ..........................3

Total .............................................................................................6–7

PLANT BIOLOGY MINOR

The minor consists of a minimum of 24 semester hours. Required courses are as follows:

PLB 200 Biology of Plants SQ* ............................................3
PLB 201 Biology of Plants Laboratory SQ* .........................1
PLB 306 Plant Anatomy ..........................................................4
or PLB 308 Plant Physiology (4)
or PLB 310 The Flora of Arizona (4)

Total .................................................................................................8

* Both PLB 200 and 201 must be taken to secure SQ credit.

The remaining 12 hours are selected by the student through consultation with an academic advisor. Eight of these 12 hours must be in upper-division courses in the life sciences or other advisor-approved areas.

The minor can be designed after one of the four curricular options offered by the department. Courses not available for credit for majors in the life sciences cannot be used for the minor. This minor is not available to students in the life sciences.

GRADUATE PROGRAMS

The faculty in the Department of Plant Biology offer programs leading to the degrees of M.S. and Ph.D. The faculty also participate in programs leading to the Master of Natural Science degree when one of the concentrations is plant biology. The department participates in the interdisciplinary program for the M.S. and Ph.D. degrees in Molecular and Cellular Biology. Other select faculty collaborate in the interdisciplinary concentration in ecology.

PLANT BIOLOGY (PLB)

PLB 108 Concepts in Plant Biology. (4)
fall, spring, summer
Introduction to concepts of plant biology that are of human relevance using commercially important, edible, and medicinal plants as examples. Not for majors in the biological sciences. 3 hours lecture, 3 hours lab. Fee.

General Studies: SQ

PLB 200 Biology of Plants. (3)
fall and spring
Analyzes the structure/function interaction for plant cells and tissues and properties that emerge in whole plants. Prerequisites: high school biology and chemistry.

General Studies: SQ (if credit also earned in PLB 201)

PLB 201 Biology of Plants Laboratory. (1)
fall and spring
Lab/field experiments to teach techniques and protocols of the scientific process; reinforces concepts from lecture by asking questions and solving problems. Lab. Prerequisites: high school biology and chemistry.

General Studies: SQ (if credit also earned in PLB 200)

PLB 300 Comparative Plant Diversity. (4)
fall
Survey of major plant groups and other photosynthetic organisms. Emphasis on comparative data analysis, evolutionary inference, and phylogenetic methods. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

General Studies: L/SG

PLB 302 Plants and Civilization. (3)
fall
Plants and plant products used by people throughout the world. Cultivation, processing, and uses in modern life (beverages, fibers, foods, medicinals, and perfumes). Prerequisites: preferably both PLB 200 and 201 or 201 and 208 or only BIO 182 (or its equivalent).

PLB 304 Biology of Algae and Fungi. (3)
spring
Ecology, economics, and evolutionary diversity of the algae and fungi. Traditional and modern biotechnological uses, 2 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 305 Desert Annuals and Cacti. (3)
fall
Adaptive biology of select plants. Analysis of diverse traits permitting survival in deserts: reproduction, structure, and physiology. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 306 Plant Anatomy. (4)
fall
Development and mature structure of tissues of vascular plants; patterns and modifications of the leaf, stem, root, and flower. 3 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 400 Lichenology. (3)
spring in odd years
Chemistry, ecology, physiology, and taxonomy of lichens. 2 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 402 Mycology. (3)
spring
Fungal morphology and systematics with an introduction to fungal cell biology, ecology, economic significance, and growth and development. 2 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only MIC 206.

PLB 404 Phycology. (4)
spring
Algae (both fresh water and marine forms), emphasizing field collection and identification of local representatives. Morphological, ecological, and economic aspects of the algae. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 407 Plant Fossils and Evolution. (4)
spring in odd years
Broad survey of plant life of the past, including the structure of plant fossils, their geologic ranges, geographic distribution, and paleoenvironment. 3 hours lecture, 3 hours lab or field trip. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent).

PLB 410 Angiosperm Taxonomy. (3)
spring
Principles underlying angiosperm phylogeny. 2 hours lecture, 3 hours lab. Prerequisite: PLB 310 or instructor approval.

PLB 411 Trees and Shrubs of Arizona. (3)
fall
Identification of woody plants from desert, chaparral, and forest habitats in Arizona. 1 hour lecture, 3 hours lab, field trips. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only instructor approval.

PLB 412 Cytogenetics. (3)
not regularly offered
Chromosomal basis of inheritance. Cross-listed as BIO 441. Credit is allowed for only BIO 441 or PLB 412. Prerequisite: BIO 340.
PLB 413 Cytogenetics Laboratory. (2)
not regularly offered
Microscopic analysis of meiosis, mitosis, and aberrant cell division. 6 hours lab. Cross-listed as BIO 442. Credit is allowed for only BIO 442 or PLB 413. Pre- or corequisite: BIO 441 or PLB 412.

PLB 414 Plant Pathology. (3)
spring
Identification and control of biotic and abiotic factors that cause common disease problems to plants. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only instructor approval.

General Studies: L

PLB 416 Medical Botany. (4)
summer
Explores plants affecting human health: modern- and folk-usage medicinal plants. Quality control, clinical evidence, plant chemistry, and ethnopharmacology. 3 hours lecture, 3 hours lab. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent) or only instructor approval.

PLB 484 Internship. (3)
not regularly offered

PLB 498 Pro-Seminar. (1–7)
tall and spring
Possible topics:
(a) Plant Biology Internship. (3)
Applies a simplified version of PLB 108 to teach fifth-grade children by planting gardens and conducting indoor plant experiments.

PLB 499 Individualized Instruction. (3)
not regularly offered

PLB 502 Perspectives in Plant Biology. (3)
tall
Introduces major areas of research within the department with the goal of broadening knowledge to enable multidisciplinary research and communication. Prerequisite: instructor approval.

PLB 583 OTS: Fieldwork in Tropical Biology. (6–8)
spring and summer
Intensive field-oriented classes with Organization for Tropical Studies (OTS) in Costa Rica with emphasis on research in ecology and systemsatics. Lecture, lab, fieldwork. Cross-listed as BIO 583. Credit is allowed for only BIO 583 or PLB 583. Prerequisites: graduate standing; a course in basic ecology.

PLB 591 Seminar. (1)
tall and spring

ENVIRONMENTAL SCIENCE AND ECOLOGY

PLB 320 Environmental Science (Nonmajor). (3)
tall
Environmental and biological concepts used to understand ecological systems with specific references to problems caused by humans. Cannot be used for major credit in the biological sciences. Cross-listed as BIO 319. Credit is allowed for only BIO 319 or PLB 320.

General Studies: G

PLB 322 Environmental Science (Major). (3)
tall
Nature of environmental and biological interaction: historical and modern examples, regional and global issues. Participation in environmental problem-solving activities. Lecture, lab. Prerequisites: preferably both PLB 200 and 201 or both GLG 110 and 111 or only GPH 111.

PLB 420 Plant Ecology: Organisms and Populations. (3)
spring in odd years
Factors and controls on the physiological ecology and organization of plants and plant populations using empirical and theoretical approaches. 2 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 320 or PLB 322 (or its equivalent).

PLB 421 Plant Ecology: Communities and Ecosystems. (3)
spring in even years
Plant community organization, field sampling techniques and the structure and function of terrestrial ecosystems emphasizing the role of vegetation. 2 hours lecture, 3 hours lab. Fee. Prerequisite: BIO 320 or PLB 322 (or its equivalent).

PLB 422 Plant Geography. (3)
not regularly offered
Plant communities of the world and their interpretation, emphasizing North American plant associations. Cross-listed as GPH 422. Credit is allowed for only GPH 422 or PLB 422. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 or only GPH 111.

PLB 430 Statistical Analyses in Environmental Science. (3)
spring
ANOVAS, 1-way classification of factorial and partially hierarchical designs; introductory multivariate statistics. Prerequisite: MAT 210 (or its equivalent).

General Studies: CS

PLB 432 Computer Applications in Biology. (3)
tall
Computer analysis techniques in biology emphasizing data entry, management and analysis, and graphic portrayal. Employs mainframe and microcomputers. 2 hours lecture, 3 hours lab. Cross-listed as BIO 406. Credit is allowed for only BIO 406 or PLB 432. Prerequisites: both BIO 182 and MAT 117 (or 210) or only instructor approval.

General Studies: CS

PLB 434 Landscape Ecological Analysis and Modeling. (3)
spring in odd years
Technical methods of landscape ecological analyses. Includes mathematical and statistical examination and modeling of landscape ecological patterns and processes. Prerequisites: both BIO 320 and 406 or only PLB 432 (or its equivalent).

PLB 520 Plant Structural Adaptation. (1–3)
not regularly offered
Adaptive traits of leaf size/unique growth form on energy transfer efficiency; stomatal architecture and water-use efficiency; applications of stable isotopes. Prerequisite: BIO 320 or PLB 306 (or 308 or its equivalent).

PLB 522 Plant Photosynthetic Adaptation. (1–3)
not regularly offered
Evolution and ecology of C4 and CAM; adaptive traits improving competitive ability in natural environments; comparative physiology of desert plants. Prerequisite: PLB 308 or instructor approval.

PLB 524 Methods in Environmental Plant Physiology. (3)
spring in odd years
Techniques to measure and quantify microclimate and mass transfer. Supporting principles. 2 hours lecture, 3 hours lab. Prerequisite: BIO 320 or PLB 308.

PLANT BIOCHEMISTRY AND MOLECULAR BIOLOGY

PLB 340 Plant Cell Physiology. (4)
spring in odd years
Surveys structural and biochemical aspects of plant cell function and the relationships of cell function to whole plant processes. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 or only BIO 182 (or its equivalent); CHM 101 (or 115 or 231).

PLB 350 Applied Genetics. (4)
spring
Introduction to molecular genetics with emphasis on application of genetics in solving biological questions and engineering organisms in biotechnology. 2 hours lecture, 6 hours lab. Cross-listed as MBB 350. Credit is allowed for only MBB 350 or PLB 350. Prerequisites: preferably both MBB 245 and 246 or only BIO 181 (or its equivalent).

PLB 440 Photobiology. (3)
not regularly offered
Principles underlying the effects of light on growth, development, and behavior of plants, animals, and microorganisms. Cross-listed as BIO 464. Credit is allowed for only BIO 464 or PLB 440. Prerequisites: CHM 231 (or 331); 12 hours in life sciences.

PLB 444 Plant Growth and Development. (3)
spring
Molecular basis of development, role of signal transduction pathways/ gene regulation in control of organ formation, pollination, germination, and growth. Prerequisite: BIO 353 (PLB 340 recommended).
PLB 540 Plant Biochemistry. (3)  
*not regularly offered*
Structure/function relationships of molecules, emphasizing processes unique to plants: carbon fixation, synthesis of storage products, pigments, and secondary metabolites. Prerequisites: both BCH 361 and PLB 308 or only instructor approval.

PLB 550 Plant Molecular Biology. (2)  
*spring in odd years*
Biochemistry and molecular biology of plant organelles, including protein targeting, plant viruses, and molecular designs for plant improvements. Prerequisite: instructor approval.

PLB 552 Plant Genetic Engineering. (3)  
*spring*
Plant transformation utilization of transgenic plants, transient gene expression assays, and applications of plant genetic engineering. Prerequisite: instructor approval.

PLB 553 Plant Genetic Engineering Laboratory. (2)  
*spring*
Plant transformation, utilization of transgenic plants, transient gene expression assays, and applications of plant genetic engineering. 6 hours lab. Prerequisite: instructor approval.

PLB 554 Plant Biotechnology. (3)  
*not regularly offered*
Aseptic, clonal propagation of plants and in vitro culture of cells, organs, and tissues. 2 hours lecture, 3 hours lab. Prerequisite: PLB 308 or 340 or 370.

PLB 558 Molecular Mechanisms of Photosynthesis. (3)  
*spring*
Structure and function of photosynthetic complexes; mechanism of energy conversion in plants, bacteria, and model systems. Crosslisted as BCH 558. Credit is allowed for only BCH 558 or PLB 558. Prerequisite: instructor approval.

URBAN HORTICULTURE

PLB 260 Plants in Cities: Introduction to Urban Horticulture. (4)  
*spring*
Principles and practices of horticulture, emphasizing development, growth, and propagation of horticultural plants and environmental factors that affect these processes. 3 hours lecture, 3 hours lab. Fee. Prerequisites: preferably both PLB 200 and 201 (or 108) or only BIO 182.

General Studies: SG

PLB 360 Southwest Home Horticulture. (2)  
*fall and spring*
Multimedia course for nonmajors surveying contemporary topics in Southwest home horticulture, including landscaping, flower and vegetable gardening, citriculture, interiordesign, and others.

PLB 362 Landscape Plants. (3)  
*fall*
Identification, culture, and use of amenity plants in urban landscapes. Fee. Prerequisite: PLB 260 (or its equivalent).

PLB 363 Golf Course Landscape Plants and Design. (3)  
*fall and spring*
Identification, culture, and use of plants in a golf course setting. Crosslisted as AGB 367. Credit is allowed for only AGB 367 or PLB 363. Fee.

PLB 364 Urban Forestry. (3)  
*fall*
Establishment, care, and maintenance of ornamental trees, shrubs, and vines. Prerequisite: PLB 260 (or its equivalent).

PLB 366 Interiorscape. (3)  
*fall in even years*
Identification, culture, and use of container-grown plants for interior environments. Prerequisite: PLB 260 or instructor approval.

PLB 370 Environmental Landscape Management. (3)  
*fall*
Installation, irrigation, and maintenance of amenity plants in urban landscapes with an emphasis on integrated environmental landscape technologies. 2 hours lecture, 3 hours lab. Fee. Prerequisite: PLB 260 (or its equivalent).

PLB 372 Turf Management. (3)  
*not regularly offered*
Selection, establishment, and maintenance of turf grasses for lawn and sports areas. 2 hours lecture, 3 hours lab. Prerequisite: PLB 260 (or its equivalent).

PLB 472 Greenhouse/Nursery Management. (3)  
*spring in even years*
Greenhouse structures, environment, and nursery operation. Includes irrigation, nutrition, and other principles relatively to container-grown species. Fee. Prerequisites: ERS 130 (or 225 or 226); PLB 260.

PLB 498 Pro-Seminar. (1–7)  
*not regularly offered*
Possible topics:
(a) Urban Horticulture. (1)

Department of Political Science

Robert L. Youngblood  
Chair  
(SS 410) 480/965-6551  
www.asu.edu/clas/polisci

PROFESSORS
BALL, Berman, CHAUDHURI, DAgGER, JONES,  
McDONOUGH, McGOWAN, SIMON,  
WALKER, YOUNGBLOOD

ASSOCIATE PROFESSORS
ASHLEY, CRITTENDEN, DANTICO, DOTY,  
HERRERA, KAHN, KEATING, KENNEY, MITCHELL,  
SIMHONY, SPRUYT, WARNER

ASSISTANT PROFESSORS
C. ELMAN, M. ELMAN, KRUTZ

POLITICAL SCIENCE—B.A.
The B.A. degree in Political Science consists of 42 semester hours, of which 30 must be in political science and 12 in related fields consisting of courses selected from the Departments of Anthropology, Chicana and Chicano Studies, Economics, Geography, History, Psychology, and Sociology, and the African American Studies and the Women’s Studies programs. At least 15 hours in political science must be in upper-division courses.

The following courses are required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 101</td>
<td>Political Ideologies</td>
<td>3</td>
</tr>
<tr>
<td>POS 110</td>
<td>Government and Politics</td>
<td>3</td>
</tr>
<tr>
<td>or POS 310 American National Government</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>POS 150</td>
<td>Comparative Government</td>
<td>3</td>
</tr>
<tr>
<td>or POS 160 Global Politics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>POS 301</td>
<td>Empirical Political Inquiry</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 12

Students who major in Political Science must have a minimum GPA of 2.00 for all courses that count toward the major. Upper-division courses that count toward the major must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted in the major. See “College Degree Requirements,” page 319. No more than six hours of POS 484 Internship may be applied to the major.

POLITICAL SCIENCE—B.S.
The B.S. degree in Political Science consists of 48 semester hours, of which 36 must be in political science and 12 in related fields consisting of courses selected from the Departments of Anthropology, Chicana and Chicano Stud-
ies, Economics, Geography, History, Psychology, and Sociology, and the African American Studies and the Women’s Studies programs. At least 21 hours in political science must be in upper-division courses.

The following courses are required:

**Required Courses**

POS 101 Political Ideologies SB ..............................................3
POS 110 Government and Politics SB ......................................3
or POS 310 American National Government SB (3)
POS 150 Comparative Government SB, G................................3
or POS 160 Global Politics SB, G (3)
POS 301 Empirical Political Inquiry SB ...................................3
POS 401 Political Statistics CS ..................................................3

**Total** ..................................................................................15

Students who major in Political Science must have a minimum GPA of 2.00 for all courses that count toward the major. Upper-division courses that count toward the major must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted in the major. See “College Degree Requirements,” page 319. No more than six hours of POS 484 Internship may be applied to the major.

**B.S. in Political Science with a Concentration in Public Policy Analysis**

This degree and concentration combination is intended for students with a strong interest in public policy. It is designed to help students develop perspectives and skills applicable to public policy analysis and program evaluation. This concentration consists of a minimum of 36 semester hours in political science and 12 hours in related fields.

**Required Courses**

POS 101 Political Ideologies SB ..............................................3
POS 110 Government and Politics SB ......................................3
or POS 310 American National Government SB (3)
POS 150 Comparative Government SB, G................................3
or POS 160 Global Politics SB, G (3)
POS 220 Political Issues and Public Policy SB .........................3
POS 301 Empirical Political Inquiry SB ...................................3
POS 325 Public Policy Development SB .................................3
POS 401 Political Statistics CS ..................................................3
POS 426 Elements of Public Policy SB .................................3
POS 484 Internship 1 ..................................................................1–6
POS electives 2 ........................................................................ 6–9
Electives 3 .............................................................................12

1 As approved by the political science internship coordinator.
2 Additional POS elective courses are required.
3 In closely related fields, approved by a departmental academic advisor.

**B.S. in Political Science with a Concentration in Public Policy Advocacy and Lobbying**

This degree and concentration combination is intended for students interested in affecting public policy. It is designed to help students develop perspectives and skills useful to those engaged as activists in shaping public policy. This concentration consists of a minimum of 36 semester hours in political science and 12 hours in related fields.

**Required Courses**

POS 101 Political Ideologies SB ..............................................3
POS 110 Government and Politics SB ......................................3
or POS 310 American National Government SB (3)
POS 150 Comparative Government SB, G ................................3
or POS 160 Global Politics SB, G (3)
POS 220 Political Issues and Public Policy SB .........................3
POS 313 The Congress SB .....................................................3
POS 333 Interest Groups SB ....................................................3
POS 401 Political Statistics CS ..................................................3
POS 484 Internship 1 ...............................................................1–6
POS electives 2 ........................................................................ 6–9
Electives 3 .............................................................................12

1 As approved by the political science internship coordinator.
2 Additional POS elective courses are required.
3 In closely related fields, approved by a departmental academic advisor.

**CERTIFICATES**

**Certificate in American Public Policy.** The American Public Policy Certificate is designed for undergraduate students who are anticipating careers in government, public service, or public administration and/or who are interested in understanding the dynamics of policy making and administration in American government.

Students majoring in any subject at the university may pursue the American Public Policy Certificate. To be awarded the certificate, the student must complete at least 15 semester hours of political science courses as follows:

Choose one from the courses below ...........................................3

POS 110 Government and Politics SB (3)
POS 310 American National Government SB (3)
Choose two or three from the courses below ............................. 6 or 9
POS 220 Political Issues and Public Policy SB (3)
POS 325 Public Policy Development SB (3)
POS 426 Elements of Public Policy SB (3)
Choose one or two from the courses below .............................. 3 or 6
POS 316 State and Local Government SB (3)
POS 320 Public Administration SB (3)
POS 410 Urban Government and Politics SB (3)
POS 422 Politics of Bureaucracy SB (3)
Choose up to one from the courses below ................................. up to 3
POS 313 The Congress SB (3)
POS 314 American Presidency SB (3)
POS 484 Internship (up to 3 semester hours for a policy/administration-related internship) (3)

**Total** ..................................................................................15

Certificate students must have a minimum GPA of 2.00; only courses in which students have a grade of “C” or higher count toward the certificate.

**Asian Studies Certificate or Emphasis.** Students majoring in Political Science may elect to pursue an Asian Studies Certificate combining courses from the major with selected outside courses of wholly Asian content. See “Asian Studies,” page 324, for more information.

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**NOTE:** For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
Certificate in Civic Education. The Civic Education Certificate is designed to contribute to the preparation of undergraduate students for

1. careers in primary and secondary education (where the teaching of government and civics may be involved);
2. careers or voluntary participation in politics, public service, and civic and social movements; and
3. further education in law, journalism, business, history, sociology, political science, and other fields where an understanding of questions of citizenship, leadership, community, democracy, public responsibility, and ethics is crucial.

The certificate does not substitute for degree requirements in any subject, including Political Science; rather, as a complement to the student’s chosen major, the certificate program is intended to guide students to a variety of courses whose successful completion indicates their special accomplishment in the area of civic education.

Students majoring in any subject at the university may be awarded the Civic Education Certificate upon completion of the following 15 semester hours of political science courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 101</td>
<td>Political Ideologies SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 346</td>
<td>Problems of Democracy HU</td>
<td>3</td>
</tr>
<tr>
<td>POS 442</td>
<td>American Political Thought HU</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose one from the courses below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 340</td>
<td>History of Political Philosophy I HU, H</td>
<td>3</td>
</tr>
<tr>
<td>POS 341</td>
<td>History of Political Philosophy II HU, H</td>
<td>3</td>
</tr>
<tr>
<td>POS 443</td>
<td>Topics in Contemporary Political Theory HU</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose one from the courses below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 110</td>
<td>Government and Politics SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 150</td>
<td>Comparative Government SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 270</td>
<td>American Legal System SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 300</td>
<td>Contemporary Controversies in Global Politics</td>
<td>3</td>
</tr>
<tr>
<td>POS 313</td>
<td>The Congress SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 314</td>
<td>The American Presidency SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 315</td>
<td>The Supreme Court SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 330</td>
<td>Contemporary Controversies in Domestic Politics SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 332</td>
<td>American Political Parties SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 333</td>
<td>Interest Groups SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 370</td>
<td>Law and Society SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 417</td>
<td>The Arizona Political System SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 435</td>
<td>Women and Politics SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 439</td>
<td>Minority Group Politics in America SB, C</td>
<td>3</td>
</tr>
</tbody>
</table>

Total ............................................................................................... 15

Certificate students must have a minimum GPA of 2.00; only courses in which students have a grade of “C” or higher count toward the certificate.

Certificate in International Studies. The International Studies Certificate is designed to prepare students for careers in government agencies, international governmental and nongovernmental organizations, multinational firms and banks, and for graduate studies in International Relations or Political Science. The certificate is not a substitute for degree requirements in any subject, including political science; rather, the required courses add an international and comparative dimension to the student’s chosen major.

Requirements for the certificate are intended to provide an understanding of international relations and comparative government, an awareness of global social and political-economic processes, and sensitivity to foreign political systems and cultures. These objectives are met by a sequence of political science courses in the areas of international relations, comparative politics, and area studies.

Students majoring in any subject at the university may be awarded the International Studies Certificate upon completion of the following 15 semester hours of political science courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 150</td>
<td>Comparative Government SB</td>
<td>3</td>
</tr>
<tr>
<td>POS 160</td>
<td>Global Politics SB, G</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose one from the courses below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 361</td>
<td>American Foreign Policy SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 364</td>
<td>U.S. National Security Analysis SB</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose two from the courses below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 300</td>
<td>Contemporary Controversies in Global Politics</td>
<td>3</td>
</tr>
<tr>
<td>POS 465</td>
<td>International Organization and Law SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 467</td>
<td>International Security SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 486</td>
<td>International Political Economy SB</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose one from the courses below:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS 350</td>
<td>Comparative Politics SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 355</td>
<td>Russia and Successor States SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 356</td>
<td>Western Europe SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 357</td>
<td>South Asia Politics SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 358</td>
<td>Southeast Asia SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 359</td>
<td>African Politics and Society SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 360</td>
<td>World Politics SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 451</td>
<td>China, Japan, and the Koreaes SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 452</td>
<td>China SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 453</td>
<td>South America SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 454</td>
<td>Mexico SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 455</td>
<td>Central America and the Caribbean SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 459</td>
<td>South and Southern Africa SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 463</td>
<td>Inter-American Relations SB, G</td>
<td>3</td>
</tr>
<tr>
<td>POS 468</td>
<td>Comparative Asian Foreign Policies SB, G</td>
<td>3</td>
</tr>
</tbody>
</table>

Total ............................................................................................... 15

Honors students who select an international topic for their theses may apply thesis credit toward the 15 hours of international course work for the certificate.

Depending upon their interests, certificate students are strongly advised to take 12 semester hours or more from appropriate courses in anthropology (ASB), economics (ECN), geography (GCU), history (HST), international business studies (IBS), and sociology (SOC). Knowledge of a modern foreign language equivalent to at least two years of college study is strongly recommended.

Certificate students must have a minimum GPA of 2.00; only courses in which students have a grade of “C” or higher count toward the certificate.

Latin American Studies Certificate or Emphasis. Students majoring in Political Science may elect to pursue a Latin American Studies Certificate combining courses from the major with selected outside courses of wholly Latin American content. See “Latin American Studies,” page 326, for more information.

MINOR IN POLITICAL SCIENCE

The minor in Political Science consists of 18 semester hours in political science courses, 12 hours of which must be upper-division courses. Students who minor in Political Science must have two courses from among the following:
For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.

POS 101 Political Ideologies SB ................................. 3
POS 110 Government and Politics SB ............................ 3
or POS 310 American National Government SB (3)
POS 150 Comparative Government SB, G ....................... 3
POS 160 Global Politics SB, G ...................................... 3

Students who minor in Political Science must have a minimum GPA of 2.00 for all courses that count toward the minor. Upper-division courses that count toward the minor must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted toward the minor. No more than three hours of POS 484 Internship and three hours of POS 499 Individualized Instruction may be applied to the minor.

SECONDARY EDUCATION—B.A.E.

Political Science. The major teaching field consists of 45 semester hours, 30 of which must be in political science and 15 in closely related fields.

The following courses are required:

POS 101 Political Ideologies SB ................................. 3
POS 110 Government and Politics SB ............................ 3
or POS 310 American National Government SB (3)
POS 150 Comparative Government SB, G ....................... 3
or POS 160 Global Politics SB, G (3)
POS 301 Empirical Political Inquiry SB .......................... 3
POS 417 The Arizona Political System SB ........................ 3
POS 480 Methods of Teaching Government ........................ 3

Total .................................................................................. 18

Courses may be substituted for POS 417 and 480 with departmental approval.

Students who pursue this academic specialization in political science must have a minimum GPA of 2.00 for all courses that count toward the major. Upper-division courses that count toward the major must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted toward the academic specialization. No more than six hours of POS 484 Internship may be applied to the major.

The minor teaching field consists of 24 semester hours in political science courses.

The following six courses are required:

POS 101 Political Ideologies SB ................................. 3
POS 110 Government and Politics SB ............................ 3
or POS 310 American National Government SB (3)
POS 150 Comparative Government SB, G ....................... 3
or POS 160 Global Politics SB, G (3)
POS 301 Empirical Political Inquiry SB .......................... 3
POS 417 The Arizona Political System SB ........................ 3
POS 480 Methods of Teaching Government ........................ 3

Total .................................................................................. 18

Courses may be substituted for POS 417 and 480 with departmental approval.

Students who pursue this academic specialization in political science must have a minimum GPA of 2.00 for all courses that count toward the academic specialization. Upper-division courses that count toward the academic specialization must have a grade of “C” or higher; no more than one “D” grade in a lower-division course may be counted in the minor.

Social Studies. See “Social Studies,” page 446.

GRADUATE PROGRAMS

The faculty in the Department of Political Science offer programs leading to the M.A. and Ph.D. degrees. See the Graduate Catalog for requirements.

POLITICAL SCIENCE (POS)

POS 101 Political Ideologies. (3)
fall and spring
Leading political ideas and belief systems, e.g., Marxism, liberalism, conservatism, theories of democracy, and alternative futures.
General Studies: SB
POS 110 Government and Politics. (3)
fall and spring
Major institutions of modern government and processes of individual and group political activity, with emphasis on the American experience. Meets the federal government requirement for teacher certification. Credit is allowed for only POS 110 or 310.
General Studies: SB
POS 150 Comparative Government. (3)
fall and spring
Political institutions and processes in selected foreign countries, including origins, strengths, and weaknesses of contemporary political systems and political development.
General Studies: SB, G
POS 160 Global Politics. (3)
fall and spring
Nature of contemporary world politics through the study of both general theoretical topics and specific geographical areas.
General Studies: SB, G
POS 220 Political Issues and Public Policy. (3)
once a year
Contemporary social problems and political issues, particularly development of public policy.
General Studies: SB
POS 230 Current Issues in National Politics. (3)
fall and spring
Major issues facing national governments in the domestic field. Prerequisite: ENG 101 (or 105).
General Studies: SB
POS 240 Introduction to Southeast Asia. (3)
fall
Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/GCU 240/HST 240/REL 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.
General Studies: L/SB
POS 260 Current Issues in International Politics. (3)
fall and spring
Analyzes major current problems in world politics. Prerequisite: ENG 101 (or 105).
General Studies: L/SB, G
POS 270 American Legal System. (3)
fall and spring
Concepts, institutions, classifications, and functions of law. Role of the courts and impact of judicial decision making on social change.
General Studies: SB
POS 300 Contemporary Controversies in Global Politics. (3)
fall and spring
Explores key controversies in global politics including security, economic stability, poverty, gender, race, and the environment.
General Studies: SB, G
POS 301 Empirical Political Inquiry. (3)  
fall and spring  
Logic of political inquiry, including research problems, concepts, hypotheses, theories, measurement, data collection, and analysis.  
General Studies: SB  

POS 310 American National Government. (3)  
fall and spring  
Powers, functions, and agents of American political institutions. Meets the federal government requirement for teacher certification. Credit is allowed for only POS 310 or 110.  
General Studies: SB  

POS 311 Arizona Constitution and Government. (2)  
fall and spring  
Constitution and government of the State of Arizona. Credit is allowed for only POS 311 or 316 or 417. Meets the Arizona constitution requirement for teacher certification. May not be counted for the major or a teaching major or minor in Political Science.  

POS 313 The Congress. (3)  
fall and spring  
Lawmaking process in the U.S. Congress.  
General Studies: SB  

POS 314 The American Presidency. (3)  
fall and spring  
Office, role, and power of the American presidency in the American political system.  
General Studies: SB  

POS 315 The Supreme Court. (3)  
fall and spring  
Role of the Supreme Court in American society and politics; examination of decision-making process and impact of decisions; restraint versus activism.  
General Studies: SB  

POS 316 State and Local Government. (3)  
fall and spring  
Survey of the operations, problems, and policies of state and local governments in the United States. Credit is allowed for only POS 316 or 311.  
General Studies: SB  

POS 320 Public Administration. (3)  
fall and spring  
Role of the administrator in the political process with an examination of the basic concepts of bureaucracy.  
General Studies: SB  

POS 325 Public Policy Development. (3)  
fall and spring  
Examines one or more aspects of public policy development including agenda setting, policy formulation, policy implementation, and policy analysis.  
General Studies: SB  

POS 330 Contemporary Controversies in Domestic Politics. (3)  
fall and spring  
Explores key controversies in domestic politics including the environment, the economy, poverty, gender, race, and security.  
General Studies: SB  

POS 331 Public Opinion. (3)  
fall and spring  
Formation, expression, and influence of individual and organized opinion on political institutions.  
General Studies: SB  

POS 332 American Political Parties. (3)  
fall and spring  
Development of the American party system. Party organization and functions.  
General Studies: SB  

POS 333 Interest Groups. (3)  
fall and spring  
Examines how minority, corporate, labor, farm, consumer, environmental, health, education and public interest groups, and single-issue movements influence government.  
General Studies: SB  

POS 336 Electoral Behavior. (3)  
fall and spring  
Voting behavior and the attitudes, perceptions, and activities of the citizenry in the political process.  
General Studies: SB  

POS 340 History of Political Philosophy I. (3)  
fall and spring  
Western political philosophers and their theories to the 17th century.  
General Studies: HU, H  

POS 341 History of Political Philosophy II. (3)  
fall and spring  
Western political philosophers and their theories from the 17th to the 20th centuries.  
General Studies: HU, H  

POS 346 Problems of Democracy. (3)  
fall and spring  
Issues and problems in democratic theory, e.g., the nature of democracy, majority rule, representation, equality, and the value of political participation.  
General Studies: HU  

POS 350 Comparative Politics. (3)  
fall and spring  
Theoretical approaches and political institutions, such as parties, pressure groups, legislatures, and executives, from a cross-national perspective.  
General Studies: SB, G  

POS 351 Democratization. (3)  
fall and spring  
Examines the consolidation of democracies in postauthoritarian and postcommunist settings (e.g., Latin America, Eastern Europe, Asia).  

POS 355 Russia and Successor States. (3)  
fall and spring  
Description and analysis of political institutions and practices in Russia and successor states.  
General Studies: SB, G  

POS 356 Western Europe. (3)  
fall and spring  
Structures and behavior of governmental institutions and political processes in selected countries of Western Europe.  

POS 357 South Asia Politics. (3)  
fall and spring  
Analyzes the political culture, politics, and political systems of South Asia. Lecture, discussion.  
General Studies: SB, G  

POS 358 Southeast Asia. (3)  
fall and spring  
Analyzes the political culture, politics, and political systems of Southeast Asian nations.  
General Studies: SB, G  

POS 359 African Politics and Society. (3)  
fall and spring  
Comparative analysis of socioeconomic forces, political processes, and government institutions in Africa south of the Sahara.  
General Studies: SB, G  

POS 360 World Politics. (3)  
fall and spring  
Theory and practice of statecraft as applied to selected issues, regions, or eras.  
General Studies: SB, G  

POS 361 American Foreign Policy. (3)  
fall and spring  
United States in world affairs; foreign policy since World War I. Techniques in formulating American foreign policies.  
General Studies: SB, G  

POS 364 U.S. National Security Analyses. (3)  
fall and spring  
Theoretical and empirical assessment of U.S. national security policy in the post-cold war era.  
General Studies: SB  

POS 370 Law and Society. (3)  
fall and spring  
Analyzes debates among social scientists and legal theorists concerning the relationship between "law" and "society."  
General Studies: SB  

POS 401 Political Statistics. (3)  
fall and spring  
Basic concepts in statistics as they facilitate the description, explanation, and prediction of social and political phenomena.  
General Studies: CS
POS 410 Urban Government and Politics. (3)  
Once a year  
Governmental organizations, decision-making structures, and problems of urban political systems.  
General Studies: SB

POS 417 The Arizona Political System. (3)  
Not regularly offered  
Contemporary political problems within the context of Arizona’s constitutional, political, and social frameworks. Meets the Arizona Constitution requirement for teacher certification. Credit is allowed for only POS 417 or 311.  
General Studies: SB

POS 422 Politics of Bureaucracy. (3)  
Not regularly offered  
Bureaucracy as a political entity; internal dynamics of public agencies; the relationship between public agencies and other political entities.  
General Studies: SB

POS 423 Politics of Budgeting. (3)  
Not regularly offered  
Policy process in budgeting; strategies used to influence this process; recent reforms in public budgeting.  
General Studies: SB

POS 426 Elements of Public Policy. (3)  
Once a year  
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.  
General Studies: SB

POS 431 Campaigns and Elections. (3)  
Once a year  
Examines campaigns from a multitude of perspectives including the politician, reporter, campaign strategist, and voter. Lecture, discussion.  
General Studies: SB

POS 433 Money and Politics. (3)  
Once a year  
Role of money and special interests in elections, campaign politics, and public policy-making in American politics. Lecture, discussion.  
General Studies: SB

POS 434 Media and Politics. (3)  
Once a year  
Studies mass media and politics in the United States, e.g., media and elections, media and government. Lecture, discussion.  
General Studies: SB

POS 435 Women and Politics. (3)  
Not regularly offered  
Women’s roles in various political contexts. Focus varies with instructor.  
General Studies: SB, C

POS 439 Minority Group Politics in America. (3)  
Not regularly offered  
Role of minority groups in American politics.  
General Studies: SB, C

POS 442 American Political Thought. (3)  
Once a year  
Political theories and movements from the colonial period to the present.  
General Studies: HU

POS 443 Topics in Contemporary Political Theory. (3)  
Once a year  
Major problems and theories in contemporary political thought.  
General Studies: HU

POS 445 Asian Political Thought. (3)  
Once a year  
Contemporary political ideas and theories in selected Asian countries, including the impact of Marxist and non-Marxist theories on revolutionary processes.  
General Studies: SB, G

POS 451 China, Japan, and the Koreas. (3)  
Once a year  
Comparative analysis of the political modernization experiences of China, Japan, and the two Koreas, focusing on their differing reactions to the West.  
General Studies: SB, G

POS 452 China. (3)  
Once a year  
Background of the Communist revolution, political processes, and developmental problems in China from a comparative perspective.  
General Studies: SB, G

POS 453 South America. (3)  
Once a year  
Governmental institutions, political processes, and developmental problems of the South American states.  
General Studies: SB, G

POS 454 Mexico. (3)  
Once a year  
Mexican federal, state, and local governmental institutions.  
General Studies: SB, G

POS 455 Central America and the Caribbean. (3)  
Once a year  
Governmental institutions, political processes, and developmental problems of the nation-states and dependent areas of Central America and the Caribbean.  
General Studies: SB, G

POS 459 South and Southern Africa. (3)  
Once a year  
Post-apartheid South African government and politics; South Africa and the southern African region; regional security and development.  
General Studies: SB, G

POS 463 Inter-American Relations. (3)  
Once a year  
Diplomatic relations among the Latin American states. Development of U.S. foreign policy toward Latin America.  
General Studies: SB, G

POS 465 International Organization and Law. (3)  
Once a year  
History, practical political significance, and future of international institutions, transnational regimes, and international law.  
General Studies: SB, G

POS 467 International Security. (3)  
Once a year  
Examines issues affecting the international security of states and peoples, e.g., military, economic, technological, environmental, and demographic.  
General Studies: SB, G

POS 468 Comparative Asian Foreign Policies. (3)  
Once a year  
Foreign policies of the Asian states, emphasizing their security relations and movements toward regionalism.  
General Studies: SB, G

POS 471 Constitutional Law I. (3)  
Once a year  
Development of the U.S. 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.  
General Studies: SB

POS 472 Constitutional Law II. (3)  
Once a year  
Development of the U.S. Constitution as reflected in decisions of the Supreme Court; due process; equal protection of laws; individual rights; civil liberties.  
General Studies: SB

POS 480 Methods of Teaching Government. (3)  
Not regularly offered  
Methods of instruction, organization, and presentation of subject matter in political science. Prerequisite: 15 hours in political science or instructor approval.  
POS 484 Internship. (1–12)  
Not regularly offered

Note: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
POS 485 Political Economy. (3)  
*once a year*
Problems, policies, and possibilities of various political-economic systems and the interrelationship of capitalism, socialism, and democracy.  
*General Studies: SB*

POS 486 International Political Economy. (3)  
*once a year*
Contending approaches to historical and contemporary issues of international political economy, including global welfare, equality, ecology, and peace.  
*General Studies: SB, G*

POS 498 Pro-Seminar. (3)  
*once a year*
Small group study and research for advanced students within their major area. Prerequisite: major in the department or instructor approval.  
*General Studies: L*

POS 499 Individualized Instruction. (3)  
*not regularly offered*

POS 501 Methods of Political Science. (3)  
*not regularly offered*
Problems of method and knowledge in political science, strategies of political inquiry, and issues in philosophy of social science.

POS 502 Philosophy of Political Inquiry. (3)  
*once a year*
Problems of knowledge and method in political science, with attention to both empirical and evaluative analysis.

POS 503 Empirical Political Inquiry. (3)  
*once a year*
Research methods and techniques of the discipline, emphasizing empirical foundations and analytic methods employed in subfields. Prerequisites: POS 401 (or its equivalent); instructor approval.

POS 530 American Politics. (3)  
*once a year*
Examines major debates in the study of American political processes and institutions. Covers parties, media, elections, public opinion, interest groups, and the three branches of government. Seminar.

POS 545 Themes in Political Thought. (3)  
*not regularly offered*
Examines a particular theme or problem in political thought from both a historical and contemporary perspective. May be repeated with approval of the director of graduate studies. Seminar. Prerequisite: instructor approval.

POS 550 Comparative Politics. (3)  
*once a year*
Surveys major approaches across topical areas such as revolutions, authoritarianism, policy processes, interest groups, and electoral politics. Focus varies with instructor. Seminar.

POS 560 International Relations. (3)  
*once a year*
Surveys major theoretical approaches and debates in international relations. Seminar.

POS 563 Comparative Asian Security Policies. (3)  
*not regularly offered*
Analyzes domestic and international constraints, belief systems, and economic components in security decisions by major powers and Asian nations. Seminar. Prerequisite: instructor approval.

POS 590 Reading and Conference. (1–12)  
*not regularly offered*

POS 591 Seminar. (1–12)  
*once a year*
Possible topics:  
(a) American Politics. (3)  
(b) Comparative Politics. (3)  
(c) Global Politics. (3)  
(d) Political Theory. (3)

POS 592 Research. (1–12)  
*not regularly offered*

POS 598 Special Topics. (1–4)  
*once a year*
Possible topics:  
(a) American Politics. (3)  
(b) Comparative Politics. (3)  
(c) Global Politics. (3)  
(d) Political Theory. (3)

POS 599 Thesis. (1–12)  
*not regularly offered*

POS 601 Advanced Experimental Research. (3)  
*not regularly offered*
Examines experimental and quasi-experimental research designs in political research, including laboratory techniques and topics in the analysis of variance. Prerequisite: POS 503 (or its equivalent).

POS 602 Advanced Survey Research. (3)  
*not regularly offered*
Examines survey design and conduct of political surveys, including sampling, questionnaire design, scaling, and statistical and graphical analysis of survey data. Prerequisite: POS 503 (or its equivalent).

POS 603 Polimetrics I. (3)  
*once a year*
Examines problems and practices of linear regression analysis. Provides skills to read, understand, and evaluate professional literature using regression analysis. Prerequisites: both POS 401 and 503 or only instructor approval.

POS 604 Polimetrics II. (3)  
*once a year*
Introduces qualitative techniques to research topics producing publishable papers through exposure to time-series, logit and probit, and simultaneous equations. Prerequisites: a combination of POS 401 and 503 and 503 or only instructor approval.

POS 606 Qualitative and Textual Analysis. (3)  
*spring in odd years*
Method and theory for the analysis of qualitative materials, systematic approaches for case studies, content analysis, critical analysis of texts. Discussion, seminar.

POS 635 State Politics and Public Policy. (3)  
*not regularly offered*
Introduction to comparative state policy emphasizing policy or performance differences among the states and the reasons for these differences. Seminar. Prerequisites: both POS 530 and 603 or only instructor approval.

POS 636 Electoral Behavior. (3)  
*not regularly offered*
Introduces fundamental concepts of electoral behavior. Emphasizes presidential elections and examines why people vote and how their votes are determined. Seminar. Prerequisites: both POS 530 and 603 or only instructor approval.

POS 638 Law and Politics. (3)  
*not regularly offered*
Examines research into such topics as constitutional law, women and the law, American legal system, judicial process, and judicial selection. Seminar. Prerequisite: instructor approval.

POS 651 Politics of Change and Development. (3)  
*not regularly offered*
Examines approaches to national, social, and political change. Seminar. Prerequisite: instructor approval.

POS 660 The Modern World System. (3)  
*not regularly offered*
Theoretically driven, historical analysis of the organization and operation of the international political economy since the 16th century. Seminar. Prerequisite: instructor approval.

POS 661 The State. (3)  
*not regularly offered*
Examines theories of state, state-society relations, and interstate politics emphasizing questions of sovereignty, territoriality, violence, representation, democracy, and change. Seminar. Prerequisite: instructor approval.

POS 662 International Organization. (3)  
*not regularly offered*
History, practical political significance, and future of international institutions, transnational regimes, and other approaches to international organization. Seminar. Prerequisite: instructor approval.
POS 664 War, Peace, and Conflict Processes. (3)
not regularly offered
Systematic analysis of the causes of war, the preconditions for peace, and approaches to the resolution of conflict. Seminar. Prerequisite: instructor approval.
POS 665 Foreign Policy Theory. (3)
not regularly offered
Examines foreign policy theory and methods. Development and critique of research designs analyzing foreign policy processes within and among nations. Seminar. Prerequisite: instructor approval.
POS 691 Seminar. (1–12)
not regularly offered
POS 790 Reading and Conference. (1–12)
not regularly offered
POS 792 Research. (3)
fall and spring
Projects in various areas of political science. Prerequisite: doctoral student.

PSYCHOLOGY—B.A.
The B.A. degree in Psychology consists of 31 semester hours in psychology, including at least 15 upper-division semester hours. Required courses, which must be passed with a minimum grade of “C,” are as follows:

PGS 101 Introduction to Psychology SB ................................................3
PGS 315 Personality Theory and Research SB ........................................3
or PGS 341 Developmental Psychology SB (3)
or PGS 350 Social Psychology SB (3)
PSY 230 Introduction to Statistics CS .....................................................3
PSY 290 Research Methods L/SG .........................................................4
PSY 323 Sensation and Perception ....................................................3
or PSY 320 Learning and Motivation (3)
or PSY 324 Memory and Cognition (3)
or PSY 325 Physiological Psychology (3)
Total ........................................................................................................16

Also required are one additional upper-division PSY course (excluding PSY 484, 492, 493, 497, and 499); two additional upper-division PGS or PSY courses; and two additional psychology courses (excluding PGS 194, 270, 484, and PSY 484 and 497). A maximum of three hours in Supervised Research or Individualized Instruction may be used to complete the 31 hours of psychology requirements. Students may take a maximum of six hours of PGS or PSY 399 and six hours of PGS 499 and PSY 499 combined. Eighteen hours in courses related to psychology must be passed with a minimum grade of “C.” They must be approved by an undergraduate advisor and include MAT 119 (or higher) in addition to one course from among the following:

CSE 180 Computer Literacy CS .........................................................3
CSE 185 Internet and the World Wide Web ........................................3
See “College Degree Requirements,” page 319.

PSYCHOLOGY—B.S.
The B.S. degree in Psychology consists of 31 semester hours in psychology, including at least 15 upper-division hours. Required courses, which must be passed with a minimum grade of “C,” are as follows:

PGS 101 Introduction to Psychology SB ................................................3
PGS 315 Personality Theory and Research SB ........................................3
or PGS 341 Developmental Psychology SB (3)
or PGS 350 Social Psychology SB (3)
PSY 230 Introduction to Statistics CS .....................................................3
PSY 290 Research Methods L/SG .........................................................4
PSY 323 Sensation and Perception ....................................................3
or PSY 320 Learning and Motivation (3)
or PSY 324 Memory and Cognition (3)
or PSY 325 Physiological Psychology (3)
Total ........................................................................................................16

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
Also required are one additional upper-division PSY course (excluding PSY 484, 492, 493, 497, and 499); two additional upper-division PGS or PSY courses; and two additional psychology courses (excluding PGS 194, 270, and 484, and PSY 484 and 497). A maximum of three semester hours of Supervised Research (PGS or PSY 399, PGS or PSY 499, or PSY 492) and a maximum of three hours of Honors Thesis (PSY 493) can be used to satisfy major requirements. Students may take a maximum of six hours of PSY or PSY 399 and six hours of PGS 499 and PSY 499 combined. Eighteen hours in courses related to psychology must be passed with a minimum grade of "C." They must be approved by an undergraduate advisor and include MAT 210 Brief Calculus (or higher); one life science lab course (BIO or MIC); one physical science lab course (AST, CHM, GLG, or PHY); and one course from among the following:

CSE 180 Computer Literacy CS.................................3
CSE 185 Internet and the World Wide Web .................3

Further, the science courses taken to satisfy the B.S. degree requirements cannot be used to meet the science (SQ or SG) portion of the university General Studies requirement.

MINOR IN PSYCHOLOGY

The minor in Psychology consists of 22 hours in psychology, including the following:

PGS 101 Introduction to Psychology SB ......................3
PGS 315 Personality Theory and Research SB ...........3
 or PGS 341 Developmental Psychology SB (3)
 or PGS 350 Social Psychology SB (3)
PSY 230 Introduction to Statistics CS ..................3
PSY 290 Research Methods L/SG.........................4
PSY 323 Sensation and Perception .........................3
 or PSY 320 Learning and Motivation (3)
 or PSY 324 Memory and Cognition (3)
 or PSY 325 Physiological Psychology (3)

Total .................................................................16

Two additional upper-division PGS or PSY courses are required.

A maximum of three semester hours of Supervised Research (PGS or PSY 399, PGS or PSY 499, or PSY 492) and a maximum of three hours of Honors Thesis (PSY 493) can be used to satisfy minor requirements. Students with an appropriate equivalent course may exclude PSY 230 from the requirements. All courses must be passed with a minimum grade of "C."

SECONDARY EDUCATION—B.A.E.

Psychology. The minor teaching field consists of 24 semester hours. See a departmental advisor.

Social Studies. See “Social Studies,” page 446.

GRADUATE PROGRAMS

The faculty in the Department of Psychology offer a program leading to the Ph.D. degree. See the Graduate Catalog for requirements.

PSYCHOLOGY (PGS)

PGS 101 Introduction to Psychology. (3)
fall, spring, summer
Major areas of theory and research in psychology. Requires participation in department-sponsored research or an educationally equivalent alternative activity.
General Studies: SB
PGS 194 Special Topics. (1–4)
not regularly offered
PGS 222 Human Sexual Behavior. (3)
fall and spring
Patterns of sexual behavior, including variations and deviations; theories of sexual attraction, sex differences, and sexual dysfunction and treatment. Prerequisite: PGS 101.
General Studies: SB
PGS 270 Psychology of Adjustment. (3)
fall, spring, summer
Principles of mental health, adjustment, conflict, stress, and coping processes derived from clinical and experimental research. Intended for nonmajors; cannot be used for major credit. Prerequisite: PGS 101.
General Studies: SB
PGS 304 Effective Thinking. (3)
fall
Understanding and improving intellectual and behavioral skills; information analysis, inference, logic, problem solving, and decision making. Prerequisite: MAT 119 or PSY 230 (or its equivalent).
General Studies: L
PGS 306 Environmental Psychology. (3)
fall, spring, summer
Concepts and research strategies in the study of behavior in interaction with physical environment. Prerequisite: PGS 101.
General Studies: SB
PGS 315 Personality Theory and Research. (3)
fall, spring, summer
Definition and description of personality in terms of theoretical and methodological approaches. Prerequisites: PGS 101; PSY 290.
General Studies: SB
PGS 341 Developmental Psychology. (3)
fall and spring
Analyzes behavior development in terms of psychological principles. Current research in human development. Prerequisites: PGS 101; PSY 290.
General Studies: SB
PGS 344 Directed Child Study. (3–4)
fall, spring, summer
Theories and methods of intervention with preschool children and supervised practicum in the Child Study Laboratory. 1 hour lecture, 6–8 hours practicum. Prerequisites: CDE 232; ECD 314 (or PSY 290).
PGS 350 Social Psychology. (3)
fall, spring, summer
Human social behavior, including such concepts as aggression, attraction, attribution, conformity, groups, helping, person perception, and persuasion. Prerequisite: PGS 101.
General Studies: SB
PGS 351 Honors Social Psychology. (3)
not regularly offered
Critical analysis of human social behavior for honors students; topics include stereotyping, social influence, attraction, aggression, helping, groups, and attitudes. Open only to students without previous credit for PGS 350. Lecture, discussion. Prerequisites: PGS 101; honors standing; instructor approval.
General Studies: L/SB
PGS 365 Community Psychology. (3)
fall and spring
Mental health and psychological well-being in the community, emphasizing current issues and related research. Prerequisite: PGS 315 or 350.
General Studies: SB
PGS 394 Special Topics. (1–4)
not regularly offered
PGS 399 Supervised Research. (1–3)
fall, spring, summer
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 before registration; "B" average in major. Pre- or corequisite: PSY 230 (or its equivalent).

PGS 414 History of Psychology. (3)
fall and spring
Historical development of psychology from its philosophical beginnings to the present. Prerequisites: PGS 101; PSY 230, 290.
General Studies: L

PGS 427 Psychology of Aging. (3)
not regularly offered
Analyzes loss, maintenance, and gain associated with cognitive and affective aging. Individual differences in coping with normative life transitions. Prerequisites: PGS 101, 341.

PGS 430 Industrial Psychology. (3)
fall, spring, summer
Organizations and management systems; motivation and work performance; human factors in systems design and evaluation; personnel selection and testing. Prerequisite: MGT 301 or PGS 101.

PGS 441 Cognitive Development. (3)
fall and spring
Experimental and theoretical literature in child development and behavior. Prerequisite: PGS 341 or instructor approval.
General Studies: L/SB

PGS 443 Abnormal Child Psychology. (3)
fall and spring
Covers major disorders of childhood and adolescence (e.g., autism, hyperactivity, phobias, and delinquency), including cause, diagnosis, treatment, and prevention. Prerequisites: both PGS 101 and 315 (or 341 or 350) or only instructor approval.
General Studies: L/SB

PGS 444 Adolescent Psychology and Psychopathology. (3)
not regularly offered
Advanced-level survey of normal adolescent psychological development and psychological disorders of this age period. Lecture, discussion. Prerequisites: PGS 101, 341; PSY 290.
General Studies: L

PGS 445 Child Language and Drawing. (3)
fall
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.

PGS 446 Social Development. (3)
not regularly offered
Discusses theory, research, and issues regarding social development. Example topics: formation of attachments, prosocial development, and gender-role development. Lecture, seminar. Prerequisite: PGS 341.

PGS 450 Social Perception and Cognition. (3)
not regularly offered
Critical analysis of human social perception and social cognition. Topics include attribution, inference, memory, attention, impression formation, stereotype change. Lecture, discussion. Prerequisites: PGS 101, 350.

PGS 451 Stereotyping, Prejudice, and Discrimination. (3)
not regularly offered

PGS 452 Applied Social Psychology. (3)
fall
Studies applications of social psychological theory and concepts in natural settings; research design and data analysis. Lecture, lab-type activities. Prerequisites: PGS 101, 350; PSY 230.
General Studies: L

PGS 453 Organizational Behavior. (3)
not regularly offered
Survey of psychological theory and research as applied to the behavior of individuals in organizational settings. Lecture, discussion. Prerequisites: PGS 101, 350.

PGS 458 Group Dynamics. (3)
fall
Theories and methods of group leadership, group effectiveness, communication within groups, and relations between groups and individual members. Prerequisite: PGS 350.

PGS 461 Interpersonal Influence. (3)
not regularly offered
Principles and procedures that affect the process of social influence; consideration of attitudinal, compliance-inducing, and perceptual influences. Prerequisite: PGS 350.

PGS 462 Health Psychology. (3)
fall and spring
Contribute to health promotion and illness prevention, adaptation to acute and chronic illness, and to the health care system. Prerequisites: PSY 230, 290.

PGS 463 Advanced Psychology of Adjustment. (3)
fall
Critical analysis and effective expression of psychological theory and research of the topic of adjustment. Lecture, discussion, writing. Prerequisites: PSY 230, 290; completion of First-Year Composition requirement; General Studies L course.

PGS 464 Minority Issues in Psychology. (3)
spring
Psychological issues relating to the diversity of human cultural experiences and among ethnic minorities in the U.S. Prerequisite: PSY 290.

PGS 465 Psychology of Stress and Coping. (3)
fall
Readings in theory and research in the area of stress and coping. Lecture, discussion, class presentations. Prerequisites: PGS 315 (or 350); PSY 290.

PGS 466 Abnormal Psychology. (3)
fall, spring, summer
Historical and current definitions, theory, and research concerning abnormal behavior. Major categories of psychopathology, including related treatment approaches. Prerequisites: PGS 101; PSY 290.

PGS 467 Psychology of Magical Beliefs. (3)
not regularly offered
Psychological nature and bases of magical beliefs and their impact on health behaviors, eating practices, and interpersonal relations. Lecture, seminar. Prerequisites: a combination of PGS 315 and 468 and PSY 434 or only instructor approval.

PGS 468 Psychology and Law. (3)
fall and spring
Theories, research, and practice in psychology as related to law, including criminal, civil, domestic relations, and professional issues. Lecture, discussion. Prerequisite: PSY 290.

PGS 471 Psychological Testing. (3)
spring
Methods and theory of psychological testing; various types of psychological tests; consideration of ethical, social, and legal aspects of testing. Prerequisite: PSY 290.

PGS 472 Clinical Psychology. (3)
fall and spring
Clinical psychology as a science and profession. Historical development, methods of interviewing, assessment, and therapeutic intervention. Prerequisite: PGS 466.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
PSYCHOLOGY (PSY)

For more PSY courses, see the "Faculty of Applied Psychology" under "East College" at "ASU East."

M PSY 230 Introduction to Statistics. (3)
Fall, Spring, Summer
Basic concepts in descriptive and inferential statistics, emphasizing applications to psychology. Self-paced (PSI) and lecture sections. Prerequisites: MAT 117; PGS 101.
General Studies: CS

M PSY 290 Research Methods. (4)
Fall and Spring
Planning, execution, analysis, and reporting of experiments. Literature, procedures, and instruments in representative areas of psychological research. 3 hours lecture, 3 hours lab. Prerequisites: ENG 101 or 105; PGS 230.

M PSY 300 Learning and Motivation. (3)
Fall, Spring, Summer
Principles of conditioning and motivation; approaches to learning, including acquisition of verbal materials, concepts, and motor skills; memory and transfer. Prerequisite: PSY 290.

M PSY 323 Sensation and Perception. (3)
Fall and Spring
Underlying processes of vision, audition, and the other senses. Applies current research and theory in a laboratory environment. Prerequisite: PSY 290 or instructor approval.

M PSY 324 Memory and Cognition. (3)
Fall, Spring, Summer
Processes underlying information storage and retrieval, including different kinds of memory, forgetting, depth of processing, and control processes. Prerequisite: PSY 290.

M PSY 325 Physiological Psychology. (3)
Fall, Spring, Summer
Relationships of physiological processes to behavior. Emphasis on nervous system functioning. Prerequisites: PSY 290 (or 2 courses in biological science); instructor approval.

M PSY 330 Statistical Methods. (3)
Spring
Advanced application of statistics to psychology. Highly recommended for students interested in attending graduate school. 3 hours lecture, 1 hour lab. Prerequisite: PSY 290.
General Studies: CS

M PSY 390 Experimental Psychology. (3)
Spring
Continuation of concepts in PSY 290, with emphasis on multifactor designs and programmatic sequence of experiments. Lecture, lab. Prerequisite: PSY 290.
General Studies: L

M PSY 399 Supervised Research. (1–3)
Fall, Spring, Summer

M PSY 400 Analysis of Behavior. (3)
Not regularly offered
Research, applications, and philosophy of the analysis and control of human behavior. Prerequisite: PSY 290.
General Studies: L

M PSY 424 Genetic Psychology. (3)
Spring
Introduction to the concepts, methodologies, and findings of behavioral genetics for Psychology majors. Prerequisites: PGS 101; PSY 230, 290.
General Studies: L

M PSY 425 Biological Bases of Behavior. (3)
Not regularly offered
Critical study of physiological psychology; brain mechanisms underlying motivation and learning. Prerequisite: PSY 325.
General Studies: L

M PSY 426 Neuroanatomy. (4)
Not regularly offered
Structure and function of mammalian brain, including sheep brain dissection. 3 hours lecture, 3 hours lab. Prerequisite: PSY 325 (or its equivalent).
General Studies: L

M PSY 434 Cognitive Psychology. (3)
Spring
Human organism as a processor of information, from perception to cognition. Abstract concepts, semantic memory, attention, and mental imagery. Prerequisite: PSY 323 or 324 or instructor approval.
General Studies: L

M PSY 437 Human Factors. (3)
Fall
Emphasizes human factors in high-technology systems. Specific topics include systems development, systems analysis techniques, displays, and controls. Prerequisites: both PSY 290 and upper-division standing or only instructor approval.
General Studies: L

M PSY 470 Psychopharmacology. (3)
Fall and Spring
Basis of drug action at physiological and behavioral levels. Psychological and medical applications and limitations of drugs used in the treatment of mental illness. Prerequisites: PSY 325; 1 semester each of biology and chemistry.

M PSY 484 Internship. (1–12)
Not regularly offered

M PSY 492 Honors Directed Study. (1–6)
Not regularly offered

M PSY 493 Honors Thesis. (1–6)
Not regularly offered

M PSY 494 Special Topics. (1–4)
Not regularly offered

M PSY 497 Honors Colloquium. (1–6)
Not regularly offered

M PSY 498 Pro-Seminar. (1–7)
Fall and Spring
Possible topics:
(a) Behavioral Neuroscience Research. (3)
General Studies: L

M PSY 499 Individualized Instruction. (1–3)
Not regularly offered

M PSY 501 Supervised Teaching. (4)
Fall
Experience in and examination of perspectives on teaching undergraduate psychology. Prerequisite: graduate standing in psychology; instructor approval.

M PSY 506 Survey of Research in Environmental Psychology. (3)
Fall
Major topics and paradigms in the study of person-environment relationships. Prerequisite: instructor approval.

M PSY 512 Advanced Learning. (3)
Not regularly offered
Principles of learning, emphasizing research literature. Prerequisite: instructor approval.

M PSY 524 Advanced Physiological Psychology. (3)
Not regularly offered
Contributions of physiological processes and brain function to fundamental behavioral processes. Prerequisite: instructor approval.

M PSY 528 Sensation and Perception. (3)
Not regularly offered
Principles of sensory and perceptual processes, emphasizing research literature. Prerequisite: instructor approval.

M PSY 530 Analysis of Variance in Psychological Research. (3)
Fall
One-way and factorial designs, contrasts, post-hoc tests, probing of interactions, mixed designs, power, computer applications. Prerequisite: undergraduate statistics or instructor approval.

M PSY 531 Multiple Regression in Psychological Research. (3)
Spring
Multiple regression and correlation, hierarchical regression, interactions, curvilinear relationships, categorical predictors, ANCOVA in regression, regression diagnostics, regression graphics. Prerequisite: PSY 530 or instructor approval.
M PSY 532 Analysis of Multivariate Data. (3)
fall
Matrix algebra for multivariate procedures, component and factor analysis, canonical and discriminant analysis, classification, MANOVA, logistic regression, hierarchical linear model. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 533 Structural Equation Modeling. (3)
spring
Path analysis; exploratory and confirmatory factor analysis; recursive and nonrecursive latent variable models; mean and covariance structures; latent growth models. Prerequisite: PSY 532 or instructor approval.

M PSY 534 Psychometric Methods. (3)
fall and spring
Theory and practice of psychological measurement using classical and modern test theories. Reliability assessment, test validation, test construction, test usage. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 535 Cognitive Processes. (3)
not regularly offered
Theoretical/empirical treatment of the human organism as a processor of information, including abstraction, memory structure, problem solving, and thinking. Prerequisite: instructor approval.

M PSY 536 Statistical Methods in Prevention Research. (3)
fall and spring
Statistical methods used in prevention research including epidemiological methods, logistic regression, program effect estimation, estimation, and mediation analysis. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 537 Longitudinal Growth Modeling. (3)
not regularly offered
Growth modeling methodology to describe individual variation in development over time. Employs multilevel and structural equation modeling frameworks. Prerequisite: PSY 533 or instructor approval.

M PSY 538 Advanced Structural Equation Modeling. (3)
not regularly offered
Mean and covariance structure analysis. Includes multiple-group modeling, two-level hierarchical modeling, longitudinal growth modeling, analysis with categorical outcomes. Prerequisite: PSY 533 or instructor approval.

M PSY 539 Meta-Analysis I. (1)
fall
Meta-analysis; searching the literature, coding study characteristics, computing effect sizes. Must be followed by PSY 540. Seminar. Prerequisites: both PSY 530 and 531 or only instructor approval.

M PSY 540 Meta-Analysis II. (2)
spring
Continuation of PSY 539. Meta-analysis; computing effect sizes, and analyzing the heterogeneity of effect sizes. Seminar. Prerequisite: PSY 539.

M PSY 541 Research in Cognitive Development. (3)
not regularly offered
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.

M PSY 542 Social Development. (3)
not regularly offered
Reviews and critiques major issues in the area of social development. Covers theory, research, and content. Prerequisite: instructor approval.

M PSY 550 Advanced Social Psychology. (3)
fall and spring
Theory and research concerning interpersonal perception, decision making, attitude formation and change, group processes, social motivation, and interaction processes. Prerequisite: instructor approval.

M PSY 551 Advanced Social Psychology. (3)
fall and spring
Continuation of PSY 550. Prerequisite: PSY 550 or instructor approval.

M PSY 553 Social Influence. (3)
not regularly offered
Researches literature relevant to attitude formation and change, conformity, obedience, power, compliance, altruism, and others. Prerequisite: PSY 551 or instructor approval.

M PSY 555 Experimental and Quasi-Experimental Designs for Research. (3)
not regularly offered
Reviews research techniques. Analyzes laboratory and field research; applications to specific topics. Prerequisite: instructor approval.

M PSY 569 Advanced Study of Personality. (3)
not regularly offered
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.

M PSY 572 Psychological Assessment. (3)
fall
Theory and research on assessment of personality, psychopathology, and intelligence; construction of psychological assessment instruments. Prerequisite: admission to clinical Ph.D. program or instructor approval.

M PSY 573 Psychopathology. (3)
fall
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.

M PSY 574 Psychotherapy. (3)
spring
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.

M PSY 578 Child Psychopathology. (3)
not regularly offered
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.

M PSY 582 Community Psychology. (3)
summer
Community systems, intervention techniques, consultation models, history and current status of community mental health movement, and conceptualization of the roles of community psychologists in social system intervention. Prerequisite: advanced standing in Psychology Ph.D. program or instructor approval.

M PSY 588 Consultation Methods. (3)
not regularly offered
Several theories and strategies of organizational consultation. Develops consultative skills through simulation and practical experience. Prerequisite: advanced standing in Psychology Ph.D. program or instructor approval.

M PSY 624 Clinical Neuroscience. (3)
spring
Examines the biological underpinnings of psychological disorders at the molecular, cellular, and system levels (schizophrenia, depression, anxiety, etc.). Lecture, pro-seminar. Prerequisites: graduate standing; instructor approval.

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
RELIGIOUS STUDIES—B.A.

The B.A. degree in Religious Studies consists of 45 semester hours, 30 of which must be in religious studies (including 21 in upper-division courses) and 15 of which must be in related fields. In order for the student to become acquainted with the character and role of religions across a wide spectrum of social and historical contexts, the 30 semester hours in religious studies must include the following courses:

1. REL 305 Ritual, Symbol, and Myth;
2. at least one course from each of the following distribution areas: Religion in the Americas, Religion and Asian Cultures, and Religion and Western Cultures; and
3. two research seminars, including REL 405 Problems in Religious Studies, which may be repeated for credit; or
4. in place of a second seminar, a student may take REL 499 to write an undergraduate thesis.

The Religious Studies major is an appropriate choice for students wishing to explore such areas as African or African American studies; Islamic studies; myth, ritual, and the arts; Native American studies; and religion and politics. All majors must plan their programs in consultation with a departmental advisor. A minimum GPA of 2.50 is required in the 30 semester hours of religious studies courses.

MINOR IN RELIGIOUS STUDIES

The minor in Religious Studies consists of 18 semester hours, at least 12 of which must be in the upper division. Both REL 305 and 405 are required. For minor verification, students must consult a department advisor.
REL 201 Religion and the Modern World. (3)  
Introduction to the nature and role of religious beliefs and practices in shaping the lives of individuals and societies, with particular attention to the modern world. Prerequisite: ENG 101 (or 105).  
General Studies: L/HU

REL 202 Religion and Popular Culture. (3)  
Explores various intersectors between religion and the popular media, including music, news, advertising, the visual arts, literature, performance, and film. Lecture, discussion.  
General Studies: HU, C

REL 203 Saints and Sinners: Explorations in Sacred Biography. (3)  
Comparison of the role of biography across religions to examine the process of categorizing people as saints or sinners. Lecture, discussion.  
General Studies: HU, H

REL 205 Living and Dying. (3)  
Ways that religions have understood birth, sexuality, death and the passing of generations. Examples from traditions throughout the world. Lecture, discussion.  
General Studies: HU

REL 210 Introduction to Judaism. (3)  
Beliefs, ceremonies, festivals, and institutions of Judaism emphasizing the contemporary era. Assumes no previous knowledge about Judaism. Prerequisite: ENG 101 (or 105).  
General Studies: L/HU, H

REL 225 African American Religion. (3)  
Introduction to the history and development of the African American religious tradition. Lecture, discussion. Cross-listed as AFH 225. Credit is allowed for only AFH 225 or REL 225.  
General Studies: HU, C

REL 240 Introduction to Southeast Asia. (3)  
Interdisciplinary introduction to the cultures, religions, political systems, geography, and history of Southeast Asia. Cross-listed as ASB 240/GCU 240/HST 240/POS 240. Credit is allowed for only ASB 240 or GCU 240 or HST 240 or POS 240 or REL 240.  
General Studies: G

REL 260 Introduction to Islam. (3)  
Examines Islamic beliefs, ceremonies, festivals, and institutions. Assumes no prior knowledge about Islam. Lecture, discussion. Cross-listed as HUM 260. Credit is allowed for only HUM 260 or REL 260.  
General Studies: HU, G

REL 270 Introduction to Christianity. (3)  
Beliefs, ceremonies, festivals, and institutions of Christianity, emphasizing the contemporary era. Assumes no previous knowledge about Christianity.  
General Studies: HU

REL 301 Comparative Mysticism. (3)  
Comparative examination of Eastern and Western mystical traditions from antiquity to the present. Lecture, discussion. Prerequisite: REL 100.  
General Studies: HU

REL 305 Ritual, Symbol, and Myth. (3)  
Ritual, symbol, and myth as types of religious expression, with examples selected from the nonliterate religions of the world.  
General Studies: L/HU

REL 310 Western Religious Traditions. (3)  
Religious traditions of Judaism, Christianity, and Islam, comparing their doctrinal, institutional, and ritual systems and social histories. Lecture, discussion.  
General Studies: HU, H

REL 315 Hebrew Bible (Old Testament). (3)  
Nature, content, background, historical situation, and message of the books of the Hebrew Bible in English translation.  
General Studies: L/HU, H

REL 317 Introduction to Rabbinic Judaism. (3)  
Historical analysis of the thought, literature, and institutions of rabbinic Judaism.  
General Studies: HU, H

REL 318 Contemporary American Jewish Identities. (3)  
Analyzes the complexity and diversity of the contemporary American Jewish community in religious and secular affairs. Lecture, discussion. Cross-listed as SOC 370. Credit is allowed for only REL 318 or SOC 370.

REL 320 American Religious Traditions. (3)  
Examines the formation, development, and interaction of major American religious traditions (indigenous, African American, Asian American, and Euro-American).  
General Studies: HU, C, H

REL 321 Religion in America. (3)  
History of religion in America with attention to issues of historiography, pluralism, gender, race, ethnicity, politics, and social reform.  
General Studies: HU, C, H

REL 322 Malcolm and Martin. (3)  
Examines and contrasts the lives, ministries, contributions, and legacies of Malcolm X and Martin Luther King, Jr. Cross-listed as AFH 322. Credit is allowed for only AFH 322 or REL 322.  
General Studies: HU, C

REL 323 Black Religion: A Biographical Approach. (3)  
Examines the experiences, motivations, and contributions of a number of figures associated with African American religion. Cross-listed as AFH 323. Credit is allowed for only AFH 323 or REL 323.  
General Studies: HU, C

REL 324 Spirituals and the Blues. (3)  

REL 330 Native American Religious Traditions. (3)  
Present's world views and religious thought through the art, architecture, literature, music, mythology, ritual, and folklore of representative tribes in North America.  
General Studies: HU, C

REL 331 History of Native American Religious Traditions. (3)  
Role of religion in Native American history, including missionization, and religious adaptation; prophetic, messianic, and religious revitalization movements.  
General Studies: L/HU, C, H

REL 332 South American Indian Religions. (3)  
Introduction to the sacred stories, ceremonies, and beliefs of Native South American peoples in their historical contexts.  
General Studies: HU, G

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.
REL 344 Religion and Values in Japanese Life. (3)  
Once a year  
Japanese values expressed in the life and annual cycles of the family,  
local and national identities, and popular culture. Lecture, discussion.  
General Studies: HU, G

REL 345 Asian Religious Traditions. (3)  
Once a year  
Introduction to the major concepts of religious beliefs, rituals, and  
practices in Hinduism and Buddhism. Lecture, discussion.  
General Studies: HU, G

REL 350 Hinduism. (3)  
Once a year  
Studies diverse forms of Hinduism through its institutions, literature,  
folklore, art, and architecture.  
General Studies: L/HU, G

REL 355 Japanese Cities and Cultures to 1800. (3)  
Once a year  
Relations among ideas and literary, visual, and performing arts of the  
ancient aristocracy, medieval samurai, and early modern townspeople.  
Cross-listed as HUM 310. Credit is allowed for only HUM 310 or  
REL 355.  
General Studies: L/HU, H

REL 351 Buddhism. (3)  
Once a year  
Doctrines, practices, and institutions of the Buddhist religion, emphasi-  
sing its role in the history and culture of Asian societies.  
General Studies: L/HU, G

REL 352 Asia Minor and the Invention of Christianity. (3)  
Once a year  
Examines the history of the early Christian communities; historical inves-  
tigations of the types of oral and written tradition in the New Testament.  
General Studies: HU

REL 354 Japanese Religions. (3)  
Once a year  
Introduction to the major concepts of religious beliefs, rituals, and  
General Studies: HU, G

REL 355 Japanese Cities and Cultures to 1800. (3)  
Once a year  
Relations among ideas and literary, visual, and performing arts of the  
ancient aristocracy, medieval samurai, and early modern townspeople.  
Cross-listed as HUM 310. Credit is allowed for only HUM 310 or  
REL 355.  
General Studies: L/HU, H

REL 357 Women and Religion. (3)  
Once a year  
Examines the worldwide transformations of Islamic religion, cultures,  
and societies in the modern period. Lecture, discussion.  
General Studies: HU, H

REL 366 Islam in the Modern World. (3)  
Spring  
Examines the worldwide transformations of Islamic religion, cultures,  
and societies in the modern period. Lecture, discussion.  
General Studies: HU, H

REL 371 New Testament. (3)  
Once a year  
Origins and literature of early Christian communities; historical investi-  
gations of the types of oral and written tradition in the New Testament.  
General Studies: HU

REL 372 Formation of the Christian Tradition. (3)  
Once a year  
Origins, development, and expansion of Christianity; major themes  
and tensions from the New Testament world to the beginning of the  
Middle Ages.  
General Studies: HU, H

REL 373 Women in Judaism. (3)  
Spring  
Studies the legal, social, and cultural status of Jewish women in various  
historical and contemporary societies. Cross-listed as WST 372.  
Credit is allowed for only REL 373 or WST 372.

REL 374 Witchcraft and Heresy in Europe. (3)  
Not regularly offered  
Background, origins, and development of the Inquisition; persecution  
of women and marginal groups. Cross-listed as HST 361. Credit is  
allowed for only HST 361 or REL 374. Prerequisite: upper-division  
standing or instructor approval.  
General Studies: L, H

REL 375 Religion in Russia. (3)  
Not regularly offered  
Examines the history of the various religious traditions of Russia and  
the former USSR from an interdisciplinary perspective.  
General Studies: HU, H

REL 376 Religion, Nationalism, and Ethnic Conflict. (3)  
Not regularly offered  
Examines the role of religion in national and ethnic conflict in the con-  
temporary world.  
General Studies: HU, G

REL 378 Religion and Moral Issues. (3)  
Once a year  
Manner in which human religiousness relates to social concerns, e.g.,  
sexuality, the environment, bioethical issues, and violence.  
General Studies: L/HU

REL 382 Religion, Magic, and Science. (3)  
Once a year  
Relationship and conflict between religion, magic, and science in the  
West from antiquity to the present. Lecture, discussion.  
General Studies: L/HU

REL 383 Origins, Evolution, and Creation. (3)  
Not regularly offered  
Examines scientific, mythic, and religious ideas relating to origins (par-  
ticularly human). Place of antievolutionism and “scientific creationism”  
in American culture. Lecture, discussion. Cross-listed as BIO 344/  
HPS 311/HUM 371. Credit is allowed for only BIO 344 or HPS 311 or  
HUM 371 or REL 383.

REL 385 Contemporary Western Religious Thought. (3)  
Not regularly offered  
Introduction to contemporary Jewish and Christian thought. Topics  
include religion and politics, problem of evil, interpretations of God,  
and feminist theology.  
General Studies: L/HU

REL 386 America and the Holocaust. (3)  
Fall  
Analyzes the historical and sociopolitical factors that shaped U.S. pol-  
icy decisions regarding Germany’s assault on Europe’s Jews.

REL 387 American Religious Thought. (3)  
Fall and Spring  
Selected topics in religious studies; involves students in research  
interests of instructor. May be repeated for credit when topics vary.  
Seminar. Prerequisite: at least 9 semester hours of REL courses or  
instructor approval.

REL 405 Problems in Religious Studies. (3)  
Fall and Spring  
Selected topics in religious studies; involves students in research  
interests of instructor. May be repeated for credit when topics vary.  
Seminar. Prerequisite: at least 9 semester hours of REL courses or  
instructor approval.

REL 410 Judaism in Modern Times. (3)  
Not regularly offered  
Variety of expressions of Judaism and Jewishness in the modern  
period. Topics may include American Judaism or religious responses  
to the Holocaust.  
General Studies: HU, H

REL 415 The Jewish Mystical Tradition. (3)  
Not regularly offered  
Examines some of the esoteric lore of Judaism. Studies movements  
and literature such as Hasidism and Kabalah.  
General Studies: HU

REL 420 Religion in American Life and Thought. (3)  
Not regularly offered  
Influence of religion on American society, culture, and ideas; the dis-  
tinctive character of religion in America. Prerequisite: REL 320 or 321  
or its equivalent.  
General Studies: L/HU

REL 426 American Preachers and Preaching: The Sermon in  
America. (3)  
Not regularly offered  
Life and work of notable American preachers. Emergence of the  
preacher as representative of American religion. Prerequisite: REL  
320 or 321 (or its equivalent).  
General Studies: L/HU

REL 427 American Religious Thought. (3)  
Not regularly offered  
Thought of representative American religious thinkers, i.e., Jonathon  
Edwards, William Ellery Channing, Horace Bushnell, and Reinhold  
Niebuhr. Prerequisite: REL 320 or 321 (or its equivalent).  
General Studies: HU, H

REL 444 Religion in Japan. (3)  
Once a year  
Religion in Japanese history, especially the development of Japanese  
Buddhism, and religion in the modern transformation of Japan. Prere-  
ququisite: instructor approval.  
General Studies: HU, G, H
REL 460 Studies in Islamic Religion. (3)
not regularly offered
Issues in the interpretation and understanding of Islamic texts, history, society, culture, and rituals. Prerequisites: both REL 365 and Religious Studies major or only instructor approval.
General Studies: HU, G

REL 470 Religion in the Middle Ages. (3)
not regularly offered
Religious aspects of medieval life and thought; variety of forms of dissent, heresy, and reform movements from the 4th to 13th centuries.
General Studies: HU, H

REL 471 Reformation and Modern Christianity. (3)
not regularly offered
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, and the World Council of Churches.
General Studies: HU, H

REL 480 Religion and Global Politics. (3)
once a year
Explores the nature and role of religion in international politics in the modern period. Lecture, discussion. Prerequisite: junior standing or instructor approval.

REL 483 Religion and Science. (3)
spring
Investigates the correlation between science and religion as an interdisciplinary study from a historical perspective. Readings, film, lecture, discussion. Prerequisite: junior standing or instructor approval.

REL 486 Modern Critics of Religion. (3)
not regularly offered
Major theories and critiques of religion among modern social, philosophical, and religious thinkers.
General Studies: HU

REL 494 Special Topics in Religious Studies. (3)
fall and spring
Open to all students, freshmen by instructor approval only. Topics may be selected from various areas.

REL 498 PS: Pro-Seminar in Religious Studies. (3)
not regularly offered
For students with a major or minor emphasis in Religious Studies.

REL 501 Research Methods in Religious Studies. (3)
tail
Explores the major themes and methods in the study of religion, with primary focus on classical texts. Lecture, discussion. Prerequisite: Religious Studies graduate student or instructor approval.

REL 502 Research Methods in Religious Studies. (3)
spring
Explores the major themes and methods in the study of religion, with primary focus on contemporary texts. Lecture, discussion. Prerequisite: Religious Studies graduate student or instructor approval.

REL 591 Seminar. (3)
fall and spring
Topics on methodological issues in the study of religion. Prerequisite: Religious Studies graduate student or instructor approval.

REL 592 Research. (1–12)
fall and spring

REL 598 Special Topics. (1–4)
fall and spring
May be repeated for credit. Possible topics:
(a) Christianity. (3)
(b) Islam. (3)
(c) Judaism. (3)
(d) Native American Religion. (3)
(e) Problems in Religious Studies. (3)
(f) Religion in America. (3)
(g) Religion in East Asia. (3)
(h) Religion in South and Southeast Asia. (3)
(i) Study of Religion, Comparative Religion. (3)
(j) Western Religious Thought, Ethics. (3)

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see "General Studies," page 78. For graduation requirements, see "University Graduation Requirements," page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see "Classification of Courses," page 51.
focus area courses and select the remaining four courses from a list of optional courses within that focus area. SOC 484 Internships are available within the focus area option for those who qualify.

Information concerning the two options for fulfilling major requirements is available in the Department of Sociology office in SS 321, and on the Internet at www.asu.edu/clas/sociology/undergraduate/advising.

MINOR IN SOCIOLOGY

The minor in Sociology requires 18 hours, of which 12 hours must be upper-division courses, with at least six upper-division hours completed at ASU Main Campus. The required courses are as follows:

SOC 101 Introductory Sociology SB ............................................. 3
or SOC 301 Principles of Sociology SB (3)
SOC 391 Sociological Research SB ............................................. 3
or SOC 483 History of Social Thought L/SB (3)
or SOC 485 Sociology of Knowledge L/SB (3)
or SOC 486 Contemporary Theory SB (3)

Total ................................................................................................. 6

The remaining four courses consist of sociology electives.

SECONDARY EDUCATION—B.A.E.

Social Studies. The major teaching field of social studies education consists of 63 semester hours, of which 30 hours may be in criminal justice, economics, geography, history, political science, psychology, and sociology and are exactly those courses required for the B.A. degree in Sociology. Of the remaining hours, two groups of 12 hours each and one of six hours are generally taken in related social sciences plus SED 480 Special Methods of Teaching Social Studies.

The minor teaching field consists of 24 semester hours, at least six of which must be upper division. SOC 101 Introductory Sociology or SOC 301 Principles of Sociology, and SOC 470 Racial and Ethnic Relations or SOC 474 African-Americans in Modern Society are required. The remaining 18 hours must be approved by the sociology advisor in consultation with the student and must include at least one course from at least four of the following six areas:

1. family;
2. intergroup relations and social psychology;
3. political/comparative-historical;
4. social problems and processes;
5. stratification/occupations/organization; or
6. urban sociology/demography.

GRADUATE PROGRAMS

The faculty in the Department of Sociology offer programs leading to the M.A. and Ph.D. degrees. See the Graduate Catalog for requirements.

SOCIOLOGY (SOC)

SOC 101 Introductory Sociology. (3)
fall, spring, summer
Fundamentals of sociology, organization of human groups and society, processes of interaction, and social change. Credit is allowed for only SOC 101 or 301. 2 hours lecture, 1 hour discussion.
General Studies: SB

SOC 301 Principles of Sociology. (3)
fall, spring, summer
Intensive and critical analysis of the concepts of sociology. Credit is allowed for only SOC 301 or 101.
General Studies: SB

SOC 312 Sociology of Adolescence. (3)
fall, spring, summer
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.
Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 315 Courtship and Marriage. (3)
fall, spring, summer
Overview of courtship, marriage, and related processes, focusing on problematic aspects of these institutions from the sociological perspective. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 318 Overview of Aging. (3)
summer
Multidisciplinary introduction to gerontology. Explores the characteristics, experiences, needs, and problems of older persons. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 321 Sociology of Work. (3)
fall and spring
Social and cultural analysis of industry. Occupational roles, status, and social participation of workers. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB
SOC 331 Environmental Sociology. (3)
fall and spring
Analyzes human organizational responses to population growth, technological change, and environmental stressors on both a national and global scale. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB, G

SOC 332 Urban Sociology. (3)
fall and spring
Growth, characteristics, and problems of the modern city. Prerequisite: SOC 101 or 301.
General Studies: SB, G

SOC 333 Technology and Society. (3)
fall
Development of technology in relation to society, work, science, the environment, public health, and cultural values related to social change. Lecture, discussion. Prerequisite: SOC 101 or 301 or instructor approval.

SOC 340 The Sociology of Deviance. (3)
fall, spring, summer
Sociological analysis of stigmatized behaviors and conditions, including the causes, effects, and management of stigma. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 341 Modern Social Problems. (3)
fall, spring, summer
Race relations, poverty, unemployment, and other current issues. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 352 Social Change. (3)
not regularly offered
Patterns of social change, resistance to change, and change-producing agencies and processes. Prerequisite: SOC 101 or 301.
General Studies: SB, G, H

SOC 360 Sociological Psychology. (3)
fall and spring
Interaction patterns between the sociocultural order and individuals; socialization process; norms, roles, and statuses; collective behavior. Prerequisite: SOC 101 or 301.
General Studies: SB

SOC 361 Variant Sexuality. (3)
fall
Sociological research and theories dealing with homosexuality, transvestism, transsexualism, and other variations in sexual orientation and gender identity. Prerequisite: SOC 101 or 301.
General Studies: SB

SOC 363 Men and Masculinity. (3)
not regularly offered
Sociological analysis of how masculine identity is defined, negotiated, and variously constructed depending upon class, ethnicity, age, and sexual orientation. Prerequisites: SOC 301; WST 100 (or 300).
General Studies: SB

SOC 365 The Sociology of Mass Communication. (3)
fall and spring
Sociological exploration of the major mass media as a communicative process in American society. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 368 Sociology of Everyday Life. (3)
not regularly offered
Examines routine everyday behavior as it relates to problems of social order, control, change, identity, and relationships. Prerequisite: SOC 101 or 301 or instructor approval.

SOC 370 Contemporary American Jewish Identities. (3)
spring
Analyzes the complexity and diversity of the contemporary American Jewish community in religious and secular affairs. Lecture, discussion. Cross-listed as REL 318. Credit is allowed for only REL 318 or SOC 370.

SOC 390 Social Statistics I. (3)
tail, spring, summer
Descriptive and inferential statistical methods for analysis of social data. Computer applications. Prerequisites: SOC 101 (or 301); General Studies MA course.
General Studies: CS

SOC 391 Sociological Research. (3)
tail, spring, summer
Methods of sociological research, including the fundamental assumptions underlying research and some practical experience in research design, data collection techniques, and data analysis. Prerequisite: SOC 101 or 301 or 390 or instructor approval.
General Studies: SB

SOC 415 The Family. (3)
tail, spring, summer
Family considered from the institutional viewpoint; its historical development and its adaptation to a changing culture; the family system in many cultures. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 416 Marriage Problems in Contemporary Society. (3)
spring
Marital and family problems in today's society from the viewpoint of personal and cultural adjustment. Prerequisites: both SOC 101 (or 301) and an additional 3 hours in sociology or only instructor approval.
General Studies: L/SB

SOC 417 Family Violence. (3)
tail and spring
Current research and theories about domestic violence including child maltreatment, spousal aggression, and courtship violence. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 418 Aging and the Life Course. (3)
tail and spring
Social aspects of aging. Theoretical and methodological perspectives and problems of aging such as life satisfaction, retirement, and adjustment to role loss. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 420 Sociology of Religion. (3)
not regularly offered
Interrelationship of culture, society, and religion; religion and social stratification; religious, economic, and political institutions; social change and religion. Emphasis on American society and institutions. Prerequisites: both ASB 102 (or SOC 101 or 301) and an additional 3 hours in sociology or only instructor approval.
General Studies: L/SB

SOC 421 Education and Society. (3)
tail
Uses contemporary sociological perspectives to examine effects of schools and schooling on individuals and society. Prerequisite: SOC 101 or 301 or instructor approval.
General Studies: SB

SOC 422 Sociology of Complex Organizations. (3)
spring
Sociological studies of government agencies, industrial firms, labor unions, military establishments, and other large-scale organizations. Prerequisite: 6 hours in sociology (including SOC 101 or 301) or instructor approval.
General Studies: L/SB

SOC 423 Social Class and Stratification. (3)
spring
Classical and contemporary theories about who gets what and why. Examines social and economic inequalities by class, gender, and race/ethnicity. Lecture, discussion. Prerequisites: both SOC 101 (or 301) and an additional 3 hours in sociology or only instructor approval.
General Studies: L/SB

NOTE: For the General Studies requirement, courses, and codes (such as L, SQ, C, and H), see “General Studies,” page 78. For graduation requirements, see “University Graduation Requirements,” page 74. For an explanation of additional omnibus courses offered but not listed in this catalog, see “Classification of Courses,” page 51.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
<th>Terms</th>
<th>Prerequisites</th>
<th>General Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 424</td>
<td>Women and Health. (3)</td>
<td>fall</td>
<td>spring in odd years</td>
<td>Women as health care workers and issues of health, illness, and health care for women. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>L/SB</td>
</tr>
<tr>
<td>SOC 427</td>
<td>Sociology of Health and Illness. (3)</td>
<td>fall</td>
<td>spring</td>
<td>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.</td>
<td>L/SB</td>
</tr>
<tr>
<td>SOC 429</td>
<td>Sociology of Law. (3)</td>
<td>not regularly offered</td>
<td></td>
<td>Examine law as an institution; its origins, operations, and consequences. Emphasis on contemporary legal issues and problems. Prerequisite: SOC 101 or 301.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 433</td>
<td>Demographic Methods. (3)</td>
<td>spring</td>
<td></td>
<td>Science of population analysis; problems in measurements of size, composition, and changes in population. Prerequisite: SOC 101 or 301.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 446</td>
<td>Sociology of Crime. (3)</td>
<td>not regularly offered</td>
<td></td>
<td>Process of criminalization, exploring the behavior of the definers of crime, and the behavior of those defined as criminals. Prerequisites: both SOC 101 (or 301) and 340 or only instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 448</td>
<td>Epidemics and Society. (3)</td>
<td>fall</td>
<td></td>
<td>Provides a perspective on how epidemics occur, are perceived in society, and affect it. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 451</td>
<td>Comparative Sociology. (3)</td>
<td>not regularly offered</td>
<td></td>
<td>Cross-cultural study of basic social institutions; the methodology of cross-cultural research. Prerequisite: ASB 102 or SOC 101 (or 301) or instructor approval.</td>
<td>SB, G</td>
</tr>
<tr>
<td>SOC 455</td>
<td>Social Movements. (3)</td>
<td>not regularly offered</td>
<td></td>
<td>Surveys theoretical approaches and research on historical and recent social movements. Emphasis on cultural, political, and social change. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 456</td>
<td>Political Sociology. (3)</td>
<td>not regularly offered</td>
<td></td>
<td>Social factors associated with voting; nature and structure of the electorate and political parties and the nature of national and international power structure. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>SB, G</td>
</tr>
<tr>
<td>SOC 464</td>
<td>Women’s Roles. (3)</td>
<td>spring</td>
<td></td>
<td>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.</td>
<td>L/SB, C</td>
</tr>
<tr>
<td>SOC 470</td>
<td>Racial and Ethnic Relations. (3)</td>
<td>fall, spring, summer</td>
<td></td>
<td>Problems of minorities in the United States and in other racially and ethnically heterogeneous societies. Evaluates theories of prejudice and of research dealing with discrimination, desegregation, and assimilation. Lecture, discussion. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>L/SB, C</td>
</tr>
<tr>
<td>SOC 474</td>
<td>African Americans in Modern Society. (3)</td>
<td>spring</td>
<td></td>
<td>Social and cultural heritage of black Americans; achievements and current trends. Lecture, discussion. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>L/SB, C</td>
</tr>
<tr>
<td>SOC 483</td>
<td>History of Social Thought. (3)</td>
<td>fall, spring, summer</td>
<td></td>
<td>Social thought in human culture. Background of modern sociology. Prerequisite: SOC 101 or 301.</td>
<td>L/SB</td>
</tr>
<tr>
<td>SOC 484</td>
<td>Internship. (1–12)</td>
<td>fall and spring</td>
<td></td>
<td>See Department of Sociology advisor.</td>
<td>L/SB</td>
</tr>
<tr>
<td>SOC 485</td>
<td>Sociology of Knowledge. (3)</td>
<td>not regularly offered</td>
<td></td>
<td>Relationship between social conditions and the development of knowledge in modern society. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 486</td>
<td>Contemporary Theory. (3)</td>
<td>not regularly offered</td>
<td></td>
<td>Contemporary issues and crises in social theory with major focus on particular theorists. Ideological factors in theory, philosophical issues, the nature of theory and its relationship with methodology. Prerequisite: SOC 101 or 301 or instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 501</td>
<td>Practicum in Survey Research. (3)</td>
<td>fall and spring</td>
<td></td>
<td>Research practicum in survey field work, analysis, and reporting in the Phoenix Area Study. Prerequisite: SOC 391 (or its equivalent).</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 502</td>
<td>Practicum in Survey Research. (3)</td>
<td>fall and spring</td>
<td></td>
<td>Continuation of SOC 501. Prerequisite: SOC 501.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 503</td>
<td>Sociology as a Profession I. (1)</td>
<td>spring</td>
<td></td>
<td>Becoming and working as a sociologist, including how to write a vita, choose a thesis topic, or find dissertation data. Prerequisite: graduate Sociology major.</td>
<td>SB, G</td>
</tr>
<tr>
<td>SOC 504</td>
<td>Sociology as a Profession II. (1)</td>
<td>spring</td>
<td></td>
<td>Becoming and working as a sociologist, including how to write a vita, choose a thesis topic, or find dissertation data. Prerequisite: graduate Sociology major.</td>
<td>SB, G</td>
</tr>
<tr>
<td>SOC 505</td>
<td>Applied Regression Analysis. (3)</td>
<td>fall and summer</td>
<td></td>
<td>Multiple linear regression topics relevant to sociological data analysis. Computer applications. Prerequisites: SOC 390 (or its equivalent); proficiency examination.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 507</td>
<td>Social Statistics IIA: Categorical Data Analysis. (3)</td>
<td>fall</td>
<td></td>
<td>Logistic regression and related topics relevant to categorical data analysis in sociology. Computer applications. Prerequisite: SOC 505 or instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 508</td>
<td>Social Statistics IIB: Structural Equation Analysis. (3)</td>
<td>spring</td>
<td></td>
<td>Teaches structural equation models using LISREL and other computer packages. Topics include multiple group analyses and ordinal endogenous variable models. Prerequisite: SOC 505 or instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 509</td>
<td>Social Statistics IIC: Event History Analysis. (3)</td>
<td>fall and spring</td>
<td></td>
<td>Proportional hazards models and other methods for analyzing longitudinal data and establishing hazard rates of events for exploratory variables. Prerequisite: SOC 505 (or its equivalent).</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 515</td>
<td>Studies of the Family. (3)</td>
<td>spring</td>
<td></td>
<td>Current developments in the study of marriage and the family. Prerequisite: instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 585</td>
<td>Development of Sociology. (3)</td>
<td>fall</td>
<td></td>
<td>Major sociological theorists, including Durkheim, Weber, Marx, Parsons, Merton, Dahrendorf, Homans, and Mead. Prerequisite: instructor approval.</td>
<td>SB</td>
</tr>
<tr>
<td>SOC 586</td>
<td>Contemporary Sociological Theory. (3)</td>
<td>spring</td>
<td></td>
<td>Analyzes major theories, including structural-functional, conflict, social exchange, symbolic interaction, and role theory. Prerequisite: instructor approval.</td>
<td>SB</td>
</tr>
</tbody>
</table>
SOC 587 Contemporary Issues in Sociology. (3) 
spring
Philosophy of social science. Contemporary issues in sociological theory and methods. Prerequisite: instructor approval.
SOC 588 Methodological Issues in Sociology. (3) 
spring
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.
SOC 599 Thesis. (1–12) 
not regularly offered

Department of Speech and Hearing Science

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Chair
(LL 173A) 480/965-2374
www.asu.edu/clas/shs

PROFESSORS
S. BACON, CASE, DORMAN, D. INGRAM, WILCOX
ASSOCIATE PROFESSORS
LISS, SINEX
ASSISTANT PROFESSORS
AZUMA, GRAY, SHARMA
CLINICAL PROFESSOR
MATHY
CLINICAL ASSOCIATE PROFESSORS
C. BACON, BROWN, MINTZ, REMSON
CLINICAL ASSISTANT PROFESSORS
K. INGRAM, WEXLER
LECTURERS
BARTO, HOWARD, NEUMANN, O’BRIEN, QUINN, RIGGS

SPEECH AND HEARING SCIENCE—B.S.

The B.S. degree in Speech and Hearing Science consists of 45 semester hours of speech and hearing science courses emphasizing the developmental and scientific aspects of language, speech, and hearing. The following courses, or their approved equivalents, are required:

SHS 250 Introduction to Phonetics .................................................. 3
SHS 310 Anatomical and Physiological Bases of Speech .................. 3
SHS 311 Physical and Physiological Bases of Hearing .................... 3
SHS 367 Language Science SB .......................................................... 3
SHS 375 Speech Science ................................................................. 3
SHS 376 Psychoacoustics ............................................................... 3
SHS 384 Hearing Disorders ............................................................. 3
SHS 401 Introduction to Audiologic Evaluation .............................. 3
SHS 402 Modifying Communicative Behavior ................................. 3
Choose two from the courses below .............................................. 6
SHS 431 Development Speech Disorders (3)
SHS 470 Developmental Language Disorders (3)
SHS 485 Acquired Speech and Language Disorders (3)

SHS 465 Speech and Language Acquisition SB .............................. 3
SHS 496 Aural Rehabilitation ......................................................... 3
Total ............................................................................................... 40

The remaining speech and hearing science courses to complete the major are determined by the students in consultation with an advisor. A list of approved electives is available through the department. Supporting courses from related fields must include the following or their equivalents:

BIO 201 Human Anatomy and Physiology I SG .......................... 4
MAT 170 Precalculus MA ............................................................... 3
PGS 101 Introduction to Psychology SB ................................. 3
PHY 101 Introduction to Physics SQ ................................. 4
PSY 230 Introduction to Statistics CS ............................................. 3
Total ............................................................................................... 17

PSY 290 Research Methods (4) is strongly recommended.

MINOR IN SPEECH AND HEARING SCIENCE

The minor in Speech and Hearing Science consists of 24 semester hours with the following classes required:

SHS 105 Introduction to Human Communication Disorders ........... 3
SHS 250 Introduction to Phonetics .................................................. 3
SHS 310 Anatomical and Physiological Bases of Speech .................. 3
SHS 311 Physical and Physiological Bases of Hearing .................... 3
Choose one from the courses below .............................................. 3
SHS 367 Language Science SB (3)
SHS 375 Speech Science (3)
SHS 376 Psychoacoustics (3)

The remainder of the 24 credits must come from the following courses:

SHS 320 Facilitating Speech and Language Development in Early Childhood ............................................. 3
SHS 384 Hearing Disorders ......................................................... 3
SHS 401 Introduction to Audiologic Evaluation .............................. 3
SHS 402 Modifying Communicative Behavior ................................. 3
SHS 431 Developmental Speech Disorders ..................................... 3
SHS 465 Speech and Language Acquisition SB .............................. 3
SHS 470 Developmental Language Disorders ................................. 3
SHS 485 Acquired Speech and Language Disorders .................... 3
SHS 496 Aural Rehabilitation ......................................................... 3

GRADUATE PROGRAMS

The faculty in the Department of Speech and Hearing Science offer programs leading to the M.S. degree in Communication Disorders and Ph.D. degree in Speech and Hearing Science. See the Graduate Catalog for requirements.

SPEECH AND HEARING SCIENCE (SHS)

SHS 101 American Sign Language I. (4) 
fall and spring
Basic receptive/expressive conversational skills; basic grammar and syntax rules. Orientation to deafness and deaf culture. Lecture, drill, practice, lab.

SHS 102 American Sign Language II. (4) 
fall and spring
SHS 105 Introduction to Human Communication Disorders. (3)
fall and spring
Introduction to hearing, language, and speech problems in children and adults. Lecture, demonstration.

SHS 201 American Sign Language III. (4)
fall and spring
Continued development of fluency in ASL with emphasis on more abstract concepts and the ability to narrate events. Lecture, discussion, drill, lab. Prerequisite with a grade of "C" or higher: SHS 201.

SHS 202 American Sign Language IV. (4)
fall and spring
Further development of fluency in ASL with emphasis on literature, folklore, and signing narratives with multiple characters. Lecture, discussion, drill, lab. Prerequisite with a grade of "C" or higher: SHS 201.

SHS 250 Introduction to Phonetics. (3)
fall
Introduction to English phonetics with emphasis on phonetic transcription, articulation, phonology, and disorders of speech.

SHS 310 Anatomical and Physiological Bases of Speech. (3)
fall
Noncadaveric study of anatomical systems that underlie human speech and language, including respiration, phonation, articulation, and related nervous system processes. Prerequisite: BIO 201.

SHS 311 Physical and Physiological Bases of Hearing. (3)
fall
Studies the physical characteristics of sound and of the structure and function of the human auditory system. Prerequisites: BIO 201; PHY 101.

SHS 320 Facilitating Speech and Language Development in Early Childhood. (3)
fall and spring
Speech and language development and strategies for facilitating communication skills in early childhood educational settings.

SHS 367 Language Science. (3)
fall
Normative aspects and integration of language structure, comprehension, and production in children and adults. General Studies: SB

SHS 375 Speech Science. (3)
spring
Normative aspects of speech, hearing, and language. Prerequisites: SHS 310, 311.

SHS 376 Psychoacoustics. (3)
spring
Introduction to acoustics, cochlear anatomy and physiology, and the perception of sound. Prerequisite: SHS 311 or instructor approval.

SHS 384 Hearing Disorders. (3)
fall
Pathologies of the ear and associated peripheral and central hearing disorders: characteristics, management, and effects on communication. Prerequisites: SHS 311, 376.

SHS 401 Introduction to Audiologic Evaluation. (3)
fall
Measurement of the basic audiologic test battery, including audiograms, immittance, masking, and speech recognition. Prerequisites: SHS 311 and 376 and 384 (or their equivalents).

SHS 402 Modifying Communicative Behavior. (3)
fall
Principles and techniques of modifying speech and language behavior. Prerequisite: SHS 250 (or its equivalent).

SHS 431 Developmental Speech Disorders. (3)
fall
Introduction to the nature of articulation, fluency, resonance, and voice disorders in childhood. Prerequisites: SHS 250 and 310 (or their equivalents).

SHS 450 Observation. (1)
fall and spring
Opportunity to obtain observation experience at the ASU Speech and Hearing Center or at external sites. Prerequisite: instructor approval.

SHS 465 Speech and Language Acquisition. (3)
spring
Speech and language development in the normal child. Prerequisite: SHS 367 (or its equivalent). General Studies: SB

SHS 470 Developmental Language Disorders. (3)
fall
Introduction to the nature and treatment of language disorders in children. Prerequisite: SHS 465 or instructor approval.

SHS 483 Professional Issues in Communication Disorders. (3)
fall
Topics related to professional certification, accreditation, code of ethics, graduate education and other issues in speech-language pathology and audiology.

SHS 485 Acquired Speech and Language Disorders. (3)
spring
Introduction to acquired speech and language disorders across the lifespan. Prerequisites: SHS 250, 310.

SHS 494 Special Topics. (1–4)
fall and spring
May be repeated for credit. Possible topics:
(a) Hearing Disorders. (3)
(b) Research. (3)
(c) Speech and Language Disorders. (3)
Prerequisite: instructor approval.

SHS 496 Aural Rehabilitation. (3)
spring
Approaches to aural rehabilitation of children and adults. Introduction to educational audiology and assistive listening devices. Prerequisites: SHS 375 and 376 and 401 (or their equivalents).

SHS 501 Introduction to Audiolgic Evaluation. (3)
fall
Measurement of the basic audiologic test battery, including audiograms, immittance, masking, and speech recognition. Prerequisites: SHS 311 and 376 and 384 (or their equivalents).

SHS 502 Differential Diagnosis for Audiology. (4)
fall
Differential diagnosis of cochlear and retrocochlear disorders, and assessment of vestibular system. 3 hours lecture, 2 hours lab. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 504 Hearing Aids. (4)
spring
Operation, application, and fitting of amplification devices for the hearing impaired. 3 hours lecture, 2 hours lab. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 508 Pediatric Audiology. (3)
fall
Audiologic assessment, screening, and development considerations for infants and young children. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 511 Auditory Perception by the Hearing Impaired. (3)
fall
Studies how and why sensorineural hearing loss alters the perception of sound. Prerequisite: SHS 376 or instructor approval.

SHS 512 Medical Aspects of Speech and Hearing. (3)
fall
Correlation of history and physical findings with pathologic physiology and test results in speech and hearing abnormalities.

SHS 515 Audiologic Instrumentation and Calibration. (3)
fall
Electronic instruments used to produce, modify, and measure characteristics of sound. Measurement standards and methods for calibration of audiologic equipment. Lecture, lab. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 516 Auditory-Evoked Potentials. (4)
spring
Continuation of SHS 502, including electrophysiologic assessment of peripheral and central auditory nervous system. Lecture, lab. Prerequisite: SHS 502.

SHS 545 Speech Perception by the Hearing Impaired. (3)
fall
Speech perceptual problems of the hearing impaired including those who have cochlear implants. Prerequisite: SHS 375 or instructor approval.

SHS 552 Otoacoustic Emissions as a Diagnostic Tool. (3)
spring
Studies the types of otoacoustic emissions, their theoretical implications and application to clinical diagnostics. Lecture, discussion, lab. Prerequisite: SHS 376 or instructor approval.
SHS 555 Cochlear Implants. (3)  
Spring  
Current status of cochlear implant research and development. Prerequisites: both SHS 504 and 545 or only instructor approval.

SHS 565 Speech and Language Acquisition. (3)  
Spring  
Speech and language development in the normal child. Prerequisite: SHS 367 (or its equivalent).

SHS 566 Psychology of Language. (3)  
Spring  
Psycholinguistic study of the production and comprehension of language across the lifespan.

SHS 567 Neural Bases of Communication Disorders. (3)  
Fall  
Neuroscience and its application to matters of normal and disordered communication. Pre- or corequisite: SHS 310 (or its equivalent).

SHS 570 Communication Disorders and Multicultural Populations. (3)  
Spring  
Studies racial and ethnic biases and the communication behaviors and disorders in various cultural groups.

SHS 571 Augmentative Communication and Language Programming. (3)  
Spring  
Focuses on individuals across the age span who are unable or who are at risk for being unable to communicate with spoken language. Lecture, lab.

SHS 572 Language Assessment and Intervention in Early Childhood. (3)  
Fall  
Focuses on the birth to 5-year-old population who are at risk for or who have communication and language disabilities. Prerequisite: SHS 470 (or its equivalent).

SHS 573 Language Assessment and Intervention with School-Age Populations. (3)  
Spring  
Focuses on later language development, linguistic demands of academic settings, assessment and intervention strategies for older children and adolescents. Prerequisite: SHS 565 (or its equivalent).

SHS 574 Fluency Disorders and Treatment. (3)  
Fall  
Presents phenomena, etiology, assessment, and theories of stuttering, followed by various treatment procedures for children and adults who stutter. Prerequisite: SHS 431 (or its equivalent).

SHS 575 Aphasia and Related Neurogenic Language Disorders. (3)  
Fall  
Assessment and treatment of acquired neurolinguistic impairment. Prerequisite: SHS 567.

SHS 576 Neuromotor Speech Disorders. (3)  
Spring  
Evaluation and treatment of the dysarthrias and apraxia of speech. Emphasis on acquired adult disorders.

SHS 577 Craniofacial Disorders of Communication. (3)  
Summer  
Communication disorders related to anomalies of the craniofacial structures, including orofacial clefting of the lip and palate. Prerequisite: SHS 310 (or its equivalent).

SHS 578 Disorders of Voice. (3)  
Spring  
Communication disorders related to dysfunction of the phonatory and resonance systems of voice production, assessment, and treatment. Prerequisite: SHS 310 or instructor approval.

SHS 579 Feeding and Swallowing Disorders Across the Lifespan. (3)  
Fall  
Focuses on individuals across the age span who have feeding and/or swallowing disorders. Presents assessment and treatment strategies. Prerequisite: SHS 567.

SHS 580 Clinical Practicum. (1–6)  
Fall, Spring, Summer  
Supervised practicum in audiology or speech-language pathology. 1 hour staffing and 3 hours of client contact per week per hour of credit. May be repeated for credit. Prerequisites: instructor approval; student must not have provisional admission status.

SHS 581 Right Hemisphere Syndrome, Traumatic Brain Injury, and Dementia. (3)  
Spring  
Studies the nature, characteristics, and clinical management of cognitive and communicative impairments accompanying right hemisphere damage, TBI, and dementia. Prerequisite: SHS 567.

SHS 582 Differential Diagnosis of Communication Disorders. (3)  
Spring  
Procedures for assessing speech/language disorders in children and adults. 3 hours lecture, 2 hours lab. Prerequisites: SHS 250 and 310 and 465 and 567 (or their equivalents).

SHS 584 Internship. (1–6)  
Fall, Spring, Summer  
Off-campus directed experiences in audiology or speech-language pathology. May be repeated for credit. Prerequisites: SHS 580; student must consult with coordinator before registration.

SHS 585 Articulation and Phonology: Assessment and Intervention. (3)  
Spring  
Assessment and treatment of developmental articulation and phonological disorders. Prerequisites: SHS 250 and 310 (or their equivalents).

SHS 591 Seminar. (1–12)  
Fall, Spring, Summer  
Possible topics:
(a) Central Auditory Mechanisms and Learning Impairment. (3)  
Spring
(b) Cognitive and Linguistic Interactions in Adult Neurogenic Disorders. (3)  
Fall
(c) Fundamentals of Vestibular Evaluations. (3)  
Fall
(d) Research Methods in Communication Disorders. (3)  
Spring

SHS 596 Aural Rehabilitation. (3)  
Spring  
Approaches to aural rehabilitation in children and adults. Introduction to educational audiology and assistive listening devices. Prerequisite: SHS 401 or 501 (or its equivalent).

SHS 792 Research. (1–12)  
Not regularly offered

SHS 799 Dissertation. (1–15)  
Not regularly offered
Women’s Studies Program

Kathleen J. Ferraro
Director
(ECA 209) 480/965-2358
www.asu.edu/clas/womens_studies

CORE FACULTY
Professors: Koblitz, Rothschild;
Associate Professors: Ferraro, Scheiner;
Assistant Professors: Anderson, Leong, Lind

AFFILIATED FACULTY

Anthropology
Professors: Brandt, Koss-Chiono

Architecture
Assistant Professor: Ewan

Art
Professors: Codell, Fahlman, Magenta;
Associate Professor: Schleif

Art History
Associate Professor: Wolfthal

Chicana and Chicano Studies
Professor: Ruiz;
Assistant Professor: Gutierrez

Curriculum and Instruction
Professors: Edelsky, Guzetti

English
Professors: Adams, Crowley, Gutierrez, Lightfoot,
Nilsen, Rhodes, Richard, Sensibar;
Associate Professors: Chancy, DeLamotte, Horan, Morgan,
Pritchard, Tohe;
Assistant Professors: Thompson, Webb Peterson;
Senior Lecturer: Obermeier;
Lecturers: Heenan, Norton

Exercise and Wellness (ASU East)
Assistant Professor: Swan

Exercise Science and Physical Education
Professor Emeritus: Wells

Family and Human Development
Professor: Martin

Geography
Professor: Burns

History
Professors: Fuchs, Giffin, Lavin, Warrnicke;
Associate Professors: Gray, Gullet, Hendricks, Stoner

Human Communication
Professors: Carlson, Nakayama, Valentine;
Assistant Professors: Davis, Martinez

Justice Studies
Professors: Jurik, Romero, Zatz;
Assistant Professors: Adelman, Bernstein, Menjivar

Languages and Literatures
Professors: Foster, Losse;
Associate Professors: Pritchard, Tompkins;
Assistant Professors: Choi, George, Gruzinska, Rees;
Assistant Research Professional: Orlich

Management
Associate Professor: Cook

Music
Professor: Williamson

Philosophy
Associate Professor: McGregor

Psychology
Regents’ Professors: Eisenberg, Russo;
Professor: Chassin;
Associate Professor: Saenz

Psychology in Education
Professors: Bernstein, Hackett, Kerr;
Professors Emeriti: Mclsaac, Wilson;
Associate Professor: Moore

Recreation Management and Tourism
Professor: Allison

Religious Studies
Professor: Feldhaus;
Associate Professor: Fessenden

Social Work
Professors: Coudroglou, Segal;
Associate Professors: Brzuzy, Gerdes;
Assistant Professor: Hurdle

Sociology
Professors: Gordon, Kronenfeld, Kulis, Laner, Weitz;
Associate Professors: Benin, Miller-Loessi;
Assistant Professor: Agadjanian

Theatre
Professor: Knapp

Women’s Studies (ASU West)
Professor: Stage

The Women’s Studies Program is an interdisciplinary university program housed in the College of Liberal Arts and Sciences. Information on faculty affiliation is provided for reference.

WOMEN’S STUDIES—B.A.

Women’s Studies provides our students with an intensive interdisciplinary liberal arts education that enables them to write well, think critically, and analyze problems effectively. Our students take a variety of courses, including a capstone seminar requiring original research and writing, and an internship that helps them prepare for life after college. Original undergraduate research is encouraged, and some courses involve students in studying community problems and formulating policy solutions.

The B.A. degree in Women’s Studies consists of 45 semester hours (with a grade of “C” or higher), of which 33 must be taken from WST or WSH prefixes or from other prefixes designated as part of the major. The other 12 must be in closely related fields chosen in consultation with an academic advisor. At least 36 of the 45 semester hours required for the major must be completed in upper-division courses.
All Women’s Studies majors must compile a portfolio to leave on file in the Women’s Studies Program office upon graduation.

**Required Courses.** Students must complete the following courses:

- WST 100 Women and Society \( SB, C \) .................. 3
- WST 377 Creation of Feminist Consciousness \( L, C \) .......... 3
- WST 378 Contemporary Feminist Theory \( L, C \) .......... 3
- WST 484 Internship ........................................... 3
- WST 498 PS: Theoretical Issues in Women’s Studies \( L \) ............. 3

Total ........................................................................................................... 15

Students must also complete two other courses: (1) an upper-division course that provides a humanities or fine arts perspective on the lives and contributions of women; and (2) 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. No course may be used to satisfy more than one requirement.

**Electives in Closely Related Fields.** Majors must complete 12 hours of courses in fields closely related to women’s studies. These courses may be used to satisfy university General Studies requirements and graduation requirements in the College of Liberal Arts and Sciences. WST and WSH courses may not be used as related fields.

**MINOR IN WOMEN’S STUDIES**

The Women’s Studies minor consists of 18 semester hours, 12 of which must be in the upper division. The following courses are required:

- WST 100 Women and Society \( SB, C \) .................. 3
- WST 377 Creation of Feminist Consciousness \( L, C \) ............. 3
- WST 378 Contemporary Feminist Theory \( L, C \) ............. 3

Total ........................................................................................................... 6

Twelve additional hours of approved women’s studies courses must be taken after consultation with the women’s studies advisor.

The ASU and University of Tennessee women’s basketball teams faced-off in Bank One Ballpark, in downtown Phoenix, in the first-ever outdoor collegiate basketball game, raising money for women’s breast cancer research.

Tim Trumble photo
Students pursuing a minor must register at least one semester before graduation and are encouraged to meet with the women’s studies academic advisor early in their course of studies.

CERTIFICATE PROGRAM IN WOMEN’S STUDIES

The certificate program is equivalent to an interdisciplinary minor, consisting of 18 semester hours, and is open to graduate as well as undergraduate students. Students pursuing a certificate must consult with the women’s studies advisor. See “Women’s Studies,” page 327, for a description of the certificate program.

GRADUATE STUDIES

Although the Women’s Studies Program does not offer a graduate degree, it is possible to pursue a graduate degree in some existing programs with a thesis or dissertation topic related to women’s studies. Information on such programs can be obtained from the Women’s Studies Program office.

COURSES IN WOMEN’S STUDIES

Additional courses appear as Special Topics and vary semester to semester. A list of approved interdisciplinary courses that count toward the requirements for the major, minor, and certificate in Women’s Studies is available each term in the program office, ECA 209.

WOMEN’S STUDIES HUMANITIES (WSH)

WSH 413 Lesbian Culture: Images and Realities. (3)
fall and spring
Explores aspects of lesbian experience from sociological, psychological, historical, political, and literary critical perspectives. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: HU, C
WSH 464 Voices and Visions. (3)
fall and spring
Explores the contributions of visionary women in the humanities; topics vary from semester to semester. May be repeated for credit when topics vary. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: HU, C
WSH 470 Women and Popular Culture. (3)
spring
Interdisciplinary examination of how gender is constructed in popular cultural forms. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: HU, C

WOMEN’S STUDIES (WST)

WST 100 Women and Society. (3)
fall, spring, summer
Interdisciplinary introduction examining critical issues in women’s studies. Credit is allowed for only WST 100 or 300.
General Studies: SB, C
WST 294 Special Topics. (1–4)
not regularly offered
Possible topics:
(a) Women and Social Action
Fee.
WST 300 Women in Contemporary Society. (3)
fall, spring, summer
Intensive interdisciplinary examination of such topics as gender roles, work, education, sexuality, politics, health, and law. Credit is allowed for only WST 300 or 100.
General Studies: SB, C
WST 313 Women and Sexuality. (3)
fall and spring
Explores feminist theories about women’s sexuality and the relationship of these theories and related research to women’s experience. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB
WST 360 Women as Healers. (3)
spring
Examines the role of women as caregivers, healers, physicians, midwives, and nurses in different cultures and historical periods. Lecture, discussion.
WST 372 Women in Judaism. (3)
spring
Studies the legal, social, and cultural status of Jewish women in various historical and contemporary societies. Cross-listed as REL 373. Credit is allowed only for REL 373 or WST 372.
WST 373 Latina/Chicana Issues. (3)
fall and spring
Examines the roles Mexican American, Chicana, and/or Latina immigrant women play historically, socially, and politically in the United States. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C
WST 375 Women and Social Change. (3)
fall and spring
Combines research and theory on a contemporary social problem with a community action experience focusing on women’s social change initiatives. Lecture, field placement. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C
WST 377 Creation of Feminist Consciousness. (3)
fall
Explores the development of feminist theory from its roots to 1960. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L, C
WST 378 Contemporary Feminist Theory. (3)
spring
Contemporary feminist theories and exploration of the intersection of gender, race, ethnicity, and class through critical analysis. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L, C
WST 380 Gender, Race, and Class. (3)
fall and spring
Explores cultural diversity, class, and gender issues in American social life. Lecture, seminar, analysis papers, and writing. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L/SB, C
WST 457 Gender, Culture, and Development. (3)
fall and spring
Economic, cultural, and sociopolitical contexts for understanding women’s roles related to health, family, work, education, and politics in developing countries. Prerequisite: 6 hours in social science or instructor approval.
General Studies: L/SB, G
WST 460 Women and the Body. (3)
fall and spring
Interdisciplinary look at how representations of woman as body permeate culture and affect a woman’s sense of self. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C
WST 477 Women and Violence. (3)
fall
Global examination of forms of violence against women at the individual, institutional, and cultural levels, and efforts to control it. Lecture, discussion. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: SB, C
WST 484 Internship. (1–3)
fall and spring
Practical experience to enhance the academic perspectives that emerge from women’s studies instruction. Prerequisite: internship coordinator approval.
WST 498 PS: Theoretical Issues in Women’s Studies. (3)
fall and spring
Reading and research on important theoretical issues in women’s studies. Prerequisite: WST 100 or 300 or instructor approval.
General Studies: L