

School of Accountancy

2. Demonstrate a knowledge of computer skills, including PowerPoint and spreadsheet analysis. Students may demonstrate PowerPoint and spreadsheet skills with either a minimum grade of B in an equivalent transfer course or a P grade in I Sys 100 and 101.
3. Complete the following Pre-Accounting courses:
Acc 200, 210.
I Sys 201 (including 100, 101).
M Com 320.
Note: These four courses are used in determining admission to the undergraduate accounting program.
4. Complete the following introductory courses:
Econ 110.
Math 119 (or 112).
Stat 221.
Note: Where possible, it is recommended that these courses be taken before entering the Junior Core.
5. Complete the following Junior Core courses:
Acc 401, 402, 403, 404, 405, 406.
6. Complete the following Integrated Management Core courses:
Bus M 341, 361, 390, 402.
Org B 321.
Note: If completing the MAcc, these courses will be replaced by the MSM Core.
7. Complete the following after Acc 401, 402, 403, 404, 405, 406:
Acc 241.
Bus M 498.
ManEc 453.
Note: If completing the MAcc, BusM 498 should not be taken.
8. Complete Marriott School exit survey online.

*Hours include courses that may fulfill university core requirements.

Accounting (Acc)

Undergraduate Courses

Note: Students enrolled in nonbusiness programs requiring or recommending Acc 201 or 202 should enroll in 200.

200. Principles of Accounting. (3:3:0)

Financial and managerial accounting principles. Basic accounting statements, processes, and management applications. Open to all students.

201. Principles of Financial Accounting. (3:3:1) Independent Study only.

First course in concepts and methods underlying financial statements.

202. Principles of Managerial Accounting. (3:3:1) For transfer students only. Prerequisite: Acc 200.

Second course in the elementary series covering managerial problems and control of business operations.

210. Principles of Accounting 2. (3:3:0) For Marriott School of Management students only. Prerequisite: Acc 200.

Additional issues in financial and managerial accounting. Review of issues related to balance sheet accounts, performance evaluation and capital budgeting.

241. Business Law in the Environment. (3:3:0) F, W, Sp, Su Prerequisite: Marriott School of Management major status.

Introduction to legal principles and institutions affecting business.

Note: SOA 300-level classes are available to Marriott School of Management and certain other selected majors.

320. Introductory Income Tax. (3:3:0) For nonaccounting majors. Prerequisite: Acc 200.

Measurement and concepts of taxable income.

343. Business Law. (3:3:0) Prerequisite: Acc 241 or equivalent.

The law relating to negotiable instruments, secured transactions, real property, wills and trusts, and bankruptcy.

Note: All 400-level classes (except 440) are limited to accounting SOA majors.

401. Business and Accounting Information Systems. (4:4:0)

Prerequisite: admission to SOA and Marriott School.

Inputs, processing, outputs, and files of several transaction-processing subsystems. Foundation for understanding internal control. Variety of tools used to design, create, or document accounting information systems (AIS) to achieve organizational objectives.

402. Cost and Managerial Accounting. (4:4:0) Prerequisite: admission to SOA and Marriott School.

Cost and managerial accounting topics, including production processes, product costing, cost behavior analysis with regression, differential costing, capital budgeting, throughput accounting, performance measurement, and budgeting.

403. Intermediate Financial Accounting 1. (4:4:0) Prerequisite: admission to SOA and Marriott School.

Financial reporting issues for balance sheet, income statement, and cash-flow statement. Revenue recognition; accounting for long-term assets, investment securities, and derivative instruments; consolidation.

404. Financial Accounting 2. (4:4:0) Prerequisite: admission to SOA and Marriott School; Acc 401, 402, 403.

Accounting for receivables and inventory. Major reporting issues associated with liabilities and stockholders' equity. Introduction to computing basic and diluted earnings per share.

405. Fundamentals of Taxation. (4:4:0) Prerequisite: admission to SOA and Marriott School; Acc 401, 402, 403.

Tax principles applicable to business entities and individuals; tax compliance issues; tax planning as part of overall strategic planning process for businesses and individuals.

406. Financial Statement Auditing. (4:4:0) Prerequisite: admission to SOA and Marriott School; Acc 401, 402, 403.

Introduction to framework providing financial statement assurance; integrating accounting and business knowledge with concepts from other disciplines such as statistics and law; framework applied to major business cycles, providing specific knowledge in financial statement auditing.

440. Corporate Financial Reporting. (3:3:0) Prerequisite: Acc 200, 210, Bus M 301.

Accounting principles of corporate financial reporting. Judgments managers make preparing financial statement information. How complexities, alternatives, and impacts affect completed financial statements.

453. Money, the Financial System, and the Economy. (3:3:0) Prerequisite: Acc 401, 402, 403, 404, 405, 406.

Applications of industry analysis and microeconomic principles in the macroeconomic environment that influences individuals and financial intermediaries that transact in money and credit markets.

Graduate Courses

For 500- and 600-level courses, see the current Marriott School of Management School of Accountancy Web site at <http://marriottschool.byu.edu/soa> and the BYU 2006–2007 Graduate Catalog.

School of Accountancy Faculty

Professors

Albrecht, W. Steve (1977) BS, Brigham Young U., 1971; MBA, PhD, U. of Wisconsin, 1973, 1975.

Gardner, Robert L. (1978) BA, Brigham Young U., 1969; MBA, BS, U. of Utah, 1975, 1976; PhD, U. of Texas, Austin, 1979.

Glover, Steven M. (1994) BA, PhD, U. of Washington, 1987, 1994.

- Prawitt, Douglas F. (1993) BS, MAcc, Brigham Young U., 1988, 1988; PhD, U. of Arizona, 1993.
- Radebaugh, Lee H. (1980) BS, Brigham Young U., 1968; MBA, DBA, Indiana U., Bloomington, 1973.
- Randall, Boyd C. (1974) BS, JD, MBA, U. of Utah, 1965, 1967, 1968; PhD, U. of Minnesota, 1972.
- Skousen, K. Fred (1970) BS, Brigham Young U., 1965; MAS., PhD, U. of Illinois, 1966, 1968; CPA, 1968.
- Spilker, Brian C. (1993) BS, MAcc, Brigham Young U., 1987, 1987; PhD, U. of Texas, Austin, 1993.
- Stewart, Dave Nelson (1980) BA, MAcc, Brigham Young U., 1977, 1977; PhD, U. of Florida, 1980.
- Stice, Earl K. (1998) BS, MAcc, Brigham Young U., 1981, 1982; MS, PhD, Cornell U., 1986, 1988.
- Stice, James D. (1988) BS, MAcc, Brigham Young U., 1984, 1984; PhD, U. of Washington, 1988.
- Stocks, Kevin D. (1983) BS, MAcc, Brigham Young U., 1978, 1978; PhD, Oklahoma State U., 1981; CPA, 1980.
- Swain, Monte R. (1991) BS, MAcc, Brigham Young U., 1987, 1987; PhD, Michigan State U., 1991.
- Associate Professors**
- Black, Ervin L. (2000) BA, MBA, Brigham Young U., 1981, 1984; PhD, U. of Washington, 1995.
- Burton, F. Greg (2001) BA, MAcc, Utah State U., 1984, 1987; PhD, U. of South Carolina, 1994.
- Christensen, Ted E. (2000) BS, San Jose State U., 1989; MS, Brigham Young U., 1991; PhD, U. of Georgia, 1995.
- Dalebout, Richard S. (1975) BA, Brigham Young U., 1968; JD, U. of Utah, 1971.
- Summers, Scott (1999) BS, MAcc, Brigham Young U., 1990; PhD, Texas A&M U., 1995.
- Worsham, Ronald G. (1994) BS, MAcc, Brigham Young U., 1985, 1985; PhD, U. of Florida, 1994.
- Zimbelman, Mark F. (1999) BS, Brigham Young U., 1984; PhD, U. of Arizona, 1996.
- Assistant Professors**
- Barrick, John A. (2001) BS, MAcc Brigham Young U., 1991, 1991; PhD, U. of Nebraska, Lincoln, 1998.
- Charles, Shannon L. (2001) BS, Western Oregon State Coll., 1989; MBA, Oregon State U., 1995; PhD, Oklahoma State U., 2000.
- Heninger, William G. (2001) BS, MAcc, Brigham Young U., 1989, 1989; PhD, U. of Georgia, 1997.
- Johnson, Peter M. (2002) BS, MS, Southern Utah U., 1991, 1992; PhD, Arizona State U., 2003.
- Paik, Gyung H. (2000) BA, Seoul National U., Korea, 1986; MA, Brigham Young U., 1988; MBA, U. of Utah, 1995; PhD, U. of Illinois, 2000.
- Peterson, Fredric G. (1973) BA, MA, PhD, U. of Utah, 1964, 1966, 1973.
- Wilks, Jeff (2000) BS, Brigham Young U., 1995; MS, PhD, Cornell U., 1999, 2000.
- Teaching Professors**
- Livingstone, Donald H. (1995) BS, Brigham Young U., 1966; CPA, 1970.
- Nemrow, Norman R. (1993) BS, MAcc, Brigham Young U., 1978, 1979; CPA, 1981.
- Associate Teaching Professors**
- Budd, Cassy (2005) BS, Brigham Young U., 1990; MA, Utah State U., 2002.
- Cottrell, David M. (1992) BS, MAcc, MHA, Brigham Young U., 1984, 1984, 1985; PhD, Ohio State U., 1992.
- Hobson, L. Scott (2003) BS, MAcc, Brigham Young U., 1983, 1983; CPA 1985.
- Emeriti**
- Cameron, James B. (1969) BS, U. of Utah, 1956; MBA, U. of California, Los Angeles, 1958; CPA, 1960; PhD, Montana State U., 1967.
- Garrison, Ray H. (1966) BS, MS, Brigham Young U., 1960, 1961; CPA, 1962; DBA, Indiana U., Bloomington, 1966.
- Hardy, John W. (1969) BS, Brigham Young U., 1964; MBA, Indiana U., 1966; PhD, U. of Texas, Austin, 1972; CPA.
- Hubbard, Ernest Dee (1959) BS, Utah State U., 1952; MBA, U. of Utah, 1959; PhD, U. of Washington, 1967.
- Palmer, Glen O. (1964) BS, MAcc, Brigham Young U., 1961, 1963; CPA, 1963.
- Skousen, Karl M. (1958) BS, MS, Brigham Young U., 1944, 1957; CPA, 1957; PhD, Michigan State U., 1962.
- Smith, Jay M. (1971) BS, MS, Brigham Young U., 1953, 1960; PhD, Stanford U., 1965; CPA, 1958.
- Smith, Robert J. (1949) BS, Brigham Young U., 1948; MBA, Northwestern U., 1949; CPA, Illinois, 1949; CPA, Utah, 1950; DBA, Indiana U., 1957.
- Sonderegger, Emory O. (1960) BS, MS, Brigham Young U., 1956, 1957; CPA, 1963.
- Streuling, G. Fred (1976) BA, MAcc, Brigham Young U., 1963, 1964; PhD, U. of Iowa, 1971; CPA, Utah, 1965; CPA, California, 1966.
- Taylor, Dale H. (1963) BA, MA, Brigham Young U., 1951, 1953; CPA, 1955; PhD, Northwestern U., 1963.
- White, J. Morgan (1967) BS, Brigham Young U., 1951; CPA, 1953; MS, Brigham Young U., 1958.
- Woodfield, Leon W. (1960) BS, MBA, U. of Utah, 1956, 1957; CPA, CPA, 1959, 1960; DBA, Michigan State U., 1965.

Aerospace Studies (Air Force ROTC)

Colonel Lawrence S. Kingsley, Chair
380 ROTC, (801) 422-2671

Admission to Program

Students must be accepted by the department into the program.

The Discipline

The Air Force Reserve Officer Training Corps (AFROTC) is an educational program designed to provide students the opportunity to become Air Force officers while completing requirements for an undergraduate or graduate degree. Four-year and three-year programs are available for both men and women.

Career Opportunities

Officer in the United States Air Force.

General Information

Textbooks, Uniforms, and Allowance. All textbooks, uniforms, and uniform accessories are furnished by the Air Force, in addition to the tax-free allowance of \$350 to \$400 per month furnished to those in the Professional Officer Course (POC) program.

Air Force ROTC Scholarship Program. Full tuition assistance is available to students in the three-year or four-year program based on merit. By law, scholarship recipients must be under age thirty-one as of December 31 of the calendar year during which commissioning is scheduled. The scholarship includes tuition, fees, textbook allowance, and \$250 per month for freshmen, \$300 per month for sophomores, \$350 per month for juniors, and \$400 per month for seniors. Contact the department for application procedures.

Foreign Language Express Scholarships. In order to meet critical Air Force officer accession goals, the Air Force is now offering Foreign Language Express Scholarships. The program is currently open to students who will graduate December 2007 through August 2009 and who are majoring in or have an emphasis in one of twenty-three critically needed languages. Please contact the department for more details.

Field Training. All cadets wishing to enter the Professional Officer Corps (last two years) must attend a field training camp during the summer prior to their junior year. This training gives an increased understanding of the Air Force mission and operation. Students receive practical experience in leadership and management while residing on an Air Force base. At field training students receive career orientation, junior officer training, aircraft and aircrew indoctrination, survival skills, physical training, and weapons experience and learn about the function of an Air Force base.

Medical care, housing, food, and uniforms, as well as transportation to and from the training base, are provided. Approximately \$500 in pay is received for four-week training and \$625 for six-week training.

Extracurricular Activities. Each Air Force ROTC student will be able to participate in a variety of extracurricular activities, including the Arnold Air Society, the color guard, and the honor guard. Selected cadets may also participate in summer programs such as the career-field shadow program or airborne training (parachute jump school).

LDS Missions. Students who desire to serve a Church mission should do so between their freshman and sophomore years. This will facilitate entrance into the advanced course. Scholarship students may have their scholarship held while they fulfill a mission as long as they do so before entering the advanced program.

Fifth-Year Cadets. Four-year-program students in Air Force ROTC who are in a five-year university program are allowed a year of completed status after their senior AFROTC courses. Out-of-phase students and those who will be student teaching should consult with the department chair.

Discipline. Disciplinary training in the cadet corps is formulated and administered by the student officers. Air Force ROTC students are civilians and are not subject to military law.

Veterans. A veteran seeking a commission through Air Force ROTC may have part or all of the freshman and sophomore program waived. Allowances are paid in addition to G.I. Bill benefits.

Program Requirements

Four-Year Program

The more popular and preferred program is the traditional Four-Year Program. Interested freshmen register for aerospace studies in the fall term, enrolling in aerospace studies courses in the same manner as for other college courses. There is *no military obligation* for the first two years of Air Force ROTC unless on an Air Force ROTC scholarship. During this time students learn more about the Air Force and the historical development of air power. After completing the first two years, known as the General Military Course (GMC), students may *compete* for entry into the last two years, the Professional Officer Course (POC). If accepted, students will attend a four-week summer field training encampment between their sophomore and junior years before entering the POC. Cadets in the POC study leadership, management, and national defense policy while receiving a nontaxable subsistence allowance of \$350 for juniors and \$400 for seniors each month.

Three-Year Program

Students entering the program as sophomores can “dual enroll” in both the Aeros 100 and 200 academics simultaneously. These students only enroll in the 200-series labs. If accepted, students will attend a four-week field training the next summer.

Qualifications

1. Be a United States citizen.
2. Be a full-time student.
3. Be eighteen years of age, or seventeen years of age with parent's or legal guardian's consent.
4. Be physically qualified.
5. Be of good moral character.
6. Be in good academic standing.
7. Successfully pass the Air Force Officer Qualifying Test.
8. Be interviewed and selected by a board of Air Force officers.
9. Complete all commissioning requirements as follows:
 - a. Pilot or navigator candidate: Complete before age twenty-nine so as to enter undergraduate pilot/navigator training before age thirty.
 - b. Scholarship recipient: Complete before age thirty-one in eligible year of commissioning.
 - c. Nonscholarship recipient: Complete before age thirty-five.

Required Courses

1. General Military Courses: complete the following:
Aeros 100, 101, 110, 200, 201, 210, 211.
2. Professional Officer Courses: complete the following:
Aeros 300, 301, 310, 311, 400R, 401R, 410, 411.

Minor Aerospace Studies (14 hours)

Students desiring aerospace studies as a minor must complete the 14 hours of POC course work and the Air Force ROTC requirements, as well as qualify for a commission in the United States Air Force.

Aerospace Studies (Aeros)

Undergraduate Courses

100, 101. Leadership Laboratory—Freshmen. (0.5:0:2 ea.) F, W
Basic fundamentals of military leadership—drill, courtesy, planning, and organizing at various levels of responsibility.

110. The Air Force Today. (1:2:0) F Prerequisite: concurrent enrollment in Aeros 100.
Development, organization, and core values of the U.S. Air Force, emphasizing the foundations of officership.

111. Aerospace Defense, General Purpose, and Support Forces. (1:2:0) W Prerequisite: concurrent enrollment in Aeros 101.
U.S. Air Force Major Command structure and the origins of the Air Force.

200, 201. Leadership Laboratory—Sophomores. (0.5:0:2 ea.) F, W
As listed for Aeros 100/101. Increased emphasis on performance level.

210. The Developmental Growth of Air Power. (1:1:0) F
Prerequisite: concurrent enrollment in Aeros 200.
Development of various concepts of air power employment, emphasizing factors that have prompted research and technological change through the early 1960s.

211. The Developmental Growth of Air Power. (1:1:0) W
Prerequisite: concurrent enrollment in Aeros 201.
Development of various concepts of air power employment, emphasizing factors that have prompted research and technological change from Vietnam to the present.

300, 301. Leadership Laboratory—Juniors. (0.5:0:2 ea.) F, W
As listed for Aeros 100/101. Students perform as cadet officers. Emphasis on leadership development.

305R. Leadership Laboratory—Honor Guard. (1:0:3 ea.) F, W
Prerequisite: instructor's consent.
Fundamentals of military leadership and drill with the M-1 rifle; emphasizes need for response to vested authority, with opportunity to develop confidence, military bearing, and other interpersonal skills; students perform as cadet leaders.

310. Management and Leadership. (3:3:0) F Prerequisite: concurrent enrollment in Aeros 300.
Writing, speaking, and listening as communication skills; management concepts; responsibilities and ethics for an Air Force junior officer.

311. Management and Leadership. (3:3:0) W Prerequisite: concurrent enrollment in Aeros 301.
Principles of leadership, problem solving, decisions, discipline, and human relations. Emphasis on career planning as an Air Force junior officer.

320. Jet Pilot Introduction. (2:2:0) F, W

399R. Academic Internship: Leadership Intern Program. (4:0:0) Sp, Su Recommended: Aeros 201 or 301.
Air Force ROTC field leadership training course. Provides advanced fundamentals of military leadership, planning, organizing, and team building at various levels of responsibility. Enrollment limited to Air Force ROTC cadets.

400R, 401R. Leadership Laboratory—Seniors. (0.5:0:2 ea.) F, W
As listed for Aeros 100/101. Senior cadets perform in leadership positions in planning and conducting all activities of the cadet corps.

410. National Security Affairs. (3:3:0) F Prerequisite: concurrent enrollment in Aeros 400R.
Civilian control of military, civil-military interaction, the forming of defense strategy. Military profession; Russia, Europe, and East Asia regional studies.

411. National Security Affairs. (3:3:0) W Prerequisite: concurrent enrollment in Aeros 401R.
Africa, Middle East, and Latin American regional studies; military operation other than war; military justice system; officer professional development.

Aerospace Studies Faculty

Professor

Kingsley, Lawrence S. (2003) BS, Utah State U., 1977; MS, Central Missouri State U., 1983.

Assistant Professors

Armitstead, John N. (2003) BS, Utah State U., 1986; MS, Air Force Institute of Technology, 1993.

Drollette, Edward H. (2005) BS, U. of Maryland, 1991; MS, Air Force Institute of Technology, 2002.

Nugen, Mark E. (2003) BS, Florida State U., 1982.

Walker, Christopher (2004) BS, Brigham Young U., 1998; MS, U. of Alaska, Anchorage, 2003.

Afrikaans

See Germanic and Slavic Languages.

Agronomy and Horticulture

See Plant and Animal Sciences.

Akan

See Center for Language Studies.

Albanian

See Center for Language Studies.

Arabic

See Asian and Near Eastern Languages.

American Heritage

100. American Heritage. (3:3:0) F, W, Su Honors also.
Synthesis of American constitutional and economic principles, and patterns of historical development.

American Studies

American Studies Office
4095 JFSB

Kerry Soper, Coordinator
3037 JFSB, (801) 422-1242

College of Humanities Advisement Center
1175 JFSB, (801) 422-4789

Admission to Degree Program

The American Studies degree program is open enrollment.

The Discipline

The American Studies major examines the sweep of American experience, society, culture, and civilization from a variety of viewpoints—literature, history, gender, humanities, regions, politics, ethnic groups, geography, art, economics, religion, and folklore—based in core courses designed to examine the American experience from a variety of standpoints. Majors are encouraged to develop particular skills in writing; literary criticism; historical research; and social, political, and economic analysis. The program provides not only rich interdisciplinary experience but also exposure to a variety of excellent scholars and teachers.

Career Opportunities

On graduation, American Studies students are usually qualified to enter graduate and professional schools (for law, MBA, MPA, PhD), government or community service, teaching, or advanced graduate studies in the liberal arts, including American studies, American civilization, American culture, American history, and American literature.

Graduation Requirements

To receive a BYU bachelor's degree a student must complete, in addition to all requirements for a specific major, the following university requirements:

- The university core, consisting of requirements in general and religious education (See the University Core section of this catalog for details. For a complete listing of courses that meet university core requirements, see the current class schedule.)
- A minimum of 30 credit hours in residence
- A minimum of 120 credit hours
- A cumulative GPA of at least 2.0

Undergraduate Programs and Degrees

BA American Studies
Minor Western American Studies

Students should see their college advisement center for help or information concerning the undergraduate programs.

BA American Studies (45 hours*)

Major Requirements

- Students can complete the Advanced Written and Oral Communication requirement by taking Engl 311, 312, 314, 315, or 316 according to individual academic direction. Those interested in graduate work are urged to take the Hist 200, 490 option.
- Majors should begin course work in the major by taking Am St 303 fall semester of the sophomore or (at latest) junior year.
- Complete the following prerequisite courses:
 - Pl Sc 110.
 - Econ 110.
 - Hum 261, 262.
- Complete the following:
 - Am St 303.
- Complete ten courses (30 hours) from the following:
 - Am St 200, 360, 390R (twice only), 395.
 - ArtHC 345, 365.
 - Econ 274.
 - Engl 336, 358R, 392, 395R.
 - Geog 250.
 - Hist 366, 380, 395.
 - Hum 420R, 425R, 430R, 440R, 460R, 490R.
 - Pl Sc 320, 321, 322.

Note 1: Engl 358R and 395R, as well as the humanities courses, must be topics in an American subject.

Note 2: Course substitutions may be made only with written, prior permission of the American Studies coordinator unless they are on the approved list.

Note 3: Students may substitute 3 credit hours of Washington, D.C., seminar credit for one American Studies elective.

*Hours include courses that may fulfill university core requirements.

Minor Western American Studies (18 hours*)

Major Requirements

- Complete the following:
 - Am St 200.
- Complete one course from three of the following four clusters:
 - Natural Environment*
 - Biol 150.
 - Geol 101.
 - InBio 215, 225.
 - Human Heritage*
 - Hist 360, 361.
 - Social Environment*
 - Anthr 345, 346, 350.
 - Econ 274.
 - Soc 327.
 - Arts and Literature*
 - Engl 364, 368, 392.
 - Span 365.

- Complete additional elective courses to make a total of 18 hours. Electives may be chosen from the courses listed above that have not been used, from the additional courses listed below, or from topical courses on Western themes offered through academic departments or the Honors Program.
 - Anthr 530, 535.
 - Geog 306.
 - Hist 362, 363, 364, 366, 382, 386, 387, 394.
 - Pl Sc 317.
 - Rel C 342, 343.
 - Span 461.

*Hours include courses that may fulfill university core requirements.

American Studies (Am St)**Undergraduate Courses****200. The American West as a Region.** (3:3:0)

Geography, natural history, history, and cultures of the American West.

303. Studies in the American Experience. (3:3:0)

Social and intellectual life in American culture from the colonial period to the present.

360. Film in American Culture. (3:3:0)

Selected readings, lectures, and analysis of specific motion pictures as social documents, reflecting different facets of the American experience.

390R. Topics in American Studies. (3:3:0 ea.)

Multidisciplinary study of a carefully defined problem in American culture. Topics vary.

395. Theories and Methods in American Studies. (3:3:0)

Prerequisite: Am St 303.

Readings/discussion seminar introducing students to theories, definition, and practice of American Studies.

Ancient Scripture

See Religious Education in Academic Departments, Degrees, and Courses section of this catalog.

Animal and Veterinary Science

See Biology, Integrative Biology, and Plant and Animal Sciences sections of this catalog.

Anthropology

David P. Crandall, Chair
800 SWKT, (801) 422-3058

College of Family, Home, and Social Sciences Advisement Center
151 SWKT, (801) 422-3541

Admission to Degree Program

All undergraduate degree programs in the Department of Anthropology are open enrollment.

The Discipline

Anthropology's central aims are to describe, interpret, and make meaningful human behavior in sociocultural systems. It also seeks to explain the similarities and differences in human behavior patterns among all peoples and cultures, both in the present and the past. Social and cultural anthropology study human society in the present, using participant-observation, interviewing, and other techniques to understand the full round of life in a single culture, a subculture, or a multicultural system. Archaeology provides methods for learning about the world's peoples who are no longer living; thus it is an important part of the anthropological family of special skills and interests.

Career Opportunities

Distinctive contributions are made by both anthropology and archaeology majors, and therefore jobs are available wherever social and cultural differences or social system complexity create difficulties. Social services, businesses, schools, development projects, medicine, and law all offer significant careers, and recent concern with environmental protection has opened up others. University teaching and research positions are limited in growth, but highly qualified students can find positions after obtaining the PhD degree from first-rank schools.

For archaeology majors, both legal and societal interest in understanding and preserving the past have resulted in increased job opportunities in state and national agencies required to observe recent preservation laws and in private corporations serving this end.

Graduation Requirements

To receive a BYU bachelor's degree a student must complete, in addition to all requirements for a specific major, the following university requirements:

- The university core, consisting of requirements in general and religious education (See the University Core section of this catalog for details. For a complete listing of courses that meet university core requirements, see the current class schedule.)
- A minimum of 30 credit hours in residence
- A minimum of 120 credit hours
- A cumulative GPA of at least 2.0

Undergraduate Programs and Degrees

BA	Anthropology
	Emphases:
	Archaeology
	Sociocultural
BA	Anthropology (Sociocultural double major)
Minors	African Studies
	Anthropology

Students should see their college advisement center for help or information concerning the undergraduate programs.

Graduate Programs and Degrees

MA	Anthropology
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For more information see the BYU 2006–2007 Graduate Catalog.

General Information

1. Each student wishing to major in anthropology should arrange through the department office to counsel with a faculty advisor and prepare a proposed sequence of study. Following this, the student should meet with the department chair for final approval of the program.
2. Undergraduate students are allowed some, but not excessive, specialization.
3. All degrees are in the field of anthropology.

Special Opportunities for Field Study

The department offers a number of unusual curriculum and field study opportunities. Students interested in Pacific Island studies are encouraged to spend a semester or two at BYU—Hawaii, where this area of study is well represented. Selected courses are regularly counted toward BYU's major. Consult with the department chair or your faculty advisor about equivalences.

The department offers several field school opportunities. Archaeology students complete their requirement in the field school typically held in conjunction with an ongoing, local (Utah) research project and occasionally in more exotic settings (Jordan).

BA Anthropology: Archaeology Emphasis (48.5 hours*)

Major Requirements

1. Complete the following:
Anthr 101, 110, 150, 215, 300, 305, 306, 309.
2. Complete 3 hours from the following:
Anthr 351, 378, 385, 390R, 580, 590R.
3. Complete 3 hours from the following:
Anthr 350, 355, 365, 372, 374, 380, 390R, 530, 535, 540, 562, 564, 565, 566, 572, 574, 590R.
4. Complete 9 hours from the following:
Anthr 402, 430, 431, 432, 434, 435, 436, 437, 438, 440, 441, 450, 490R, 511, 512, 575.
5. Complete an additional 3 hours of electives from section 3 or 4 above.
6. Complete the following:
Anthr 454R.
7. Complete 6 hours of the following:
Anthr 455R.
8. Complete 2 hours of the following:
Anthr 456R.

*Hours include courses that may fulfill university core requirements.

BA Anthropology: Sociocultural Emphasis (51.5 hours*)

Major Requirements

1. Complete the following:
Anthr 101, 110, 150, 247, 300, 305, 306, 309.
2. Complete 6 hours from the following:
Anthr 317, 320, 326, 330, 335, 340, 343, 345, 346, 390R.
3. Complete 6 hours from the following:
Anthr 402, 430, 431, 432, 435, 436, 438, 440, 490R.
4. Complete 3 hours from the following:
Anthr 434, 437, 441, 450, 511.

- Complete an additional 3 hours of electives from section 3 or 4 above.
- Complete the following:
Anthr 442, 495, 499R.

*Hours include courses that may fulfill university core requirements.

BA Anthropology (Sociocultural Double Major)

(39.5 hours*)

The 33-hour sociocultural major is designed to accommodate the varying interests of students from a range of other disciplines, but it is only available to students completing an additional major in another field. Its purpose is to allow students with other majors to add the perspectives that anthropology is uniquely qualified to provide.

Major Requirements

- Complete all requirements of a primary major. Double counting courses between primary major and anthropology will not be allowed.
- Complete the following:
Anthr 101, 150, 305, 306, 309, 442, 495, 499R.
- Complete 6 hours from the following:
Anthr 317, 320, 326, 330, 340, 343, 345, 346, 390R.
- Complete 6 hours from the following:
Anthr 402, 430, 431, 432, 434, 435, 436, 437, 438, 440, 441, 450, 490R, 511.
- Complete an additional 3 hours from sections 3 or 4 above.

*Hours include courses that may fulfill university core requirements.

Minor African Studies (18–21 hours*)

The Discipline

The African Studies minor is designed to complement several majors. The minor features language competence, with options in several languages used in Africa, as well as courses in history and social sciences. Several options are available, and students interested in this minor are encouraged to consult with one of the coordinators of the program to find the best options to apply to their major.

Minor Requirements

- Complete one of the following language/humanities components:
 - French
Fren 321, 341, 456R.
 - Swahili
FLang 101R, 102R, 201R.
 - Afrikaans
Afrik 101, 102, 201.
 - A combination of French, Swahili, Afrikaans, upper-division Portuguese, or other language component as approved by the program coordinator. (The coordinator is Professor Chantal Thompson.)

- Complete three courses from the following social science component (a maximum of two courses per discipline; some of these courses may be offered only once every other year):

Anthr 330.
EdLF 362.
Engl 358R.
Geog 385.
Hist 249, 250.
IAS 397R.
Pl Sc 352.

Other courses may or may not be applicable, depending on the amount of African content therein. Approval of the program coordinator, therefore, is required. Courses that may contain significant African content at times include the following:

Anthr 390R, 430, 431, 432, 435, 490R.
Geog 493R.
Hist 390R.
Org B 551.
Pl Sc 472.

*Hours include courses that may fulfill university core requirements.

Minor Anthropology (16 hours)

Minor Requirements

Complete 16 hours of department courses, with no more than two courses in addition to Anthr 108R from lower-division courses offerings.

Anthropology (Anthr)

Undergraduate Courses

101. Social/Cultural Anthropology. (3:3:0) Honors also.

Aspects of society and culture: kinship, beliefs, economy, and political order among peoples worldwide. Methods and perspectives used in social/cultural anthropology.

103. Archaeology Field Trip. (1:2:0) F 1st blk.

Archaeology field trip to Four Corners. Meet weekly prior to trip. Students responsible for food and camping costs. Limited enrollment.

108R. Anthropological Films. (1:0:2 ea.) F, W

Examination of other cultures through ethnographic or archaeological film. Can be taken separately or concurrently with Anthr 101 or 110.

110. Introduction to Archaeology. (3:3:0) Honors also.

Review of great archaeological discoveries about the ancient world. Overview of world prehistory.

150. Anthropology Career Preparation. (0.5:1:0) F

Overview of anthropology major and graduation requirements; preparing for senior thesis sequence; career opportunities; and graduate school application process.

207. Experiments in Ancient Technology. (3:1:2)

Processes by which tools and other objects were produced anciently; experimental reproduction and use of ancient tools.

215. Introduction to Archaeology: Method and Theory. (3:3:0) W

Field and analytic methods and their relevance to data acquisition; use of theory and the relation of theory to methods.

247. Applied Anthropology. (3:3:0) W

Anthropological principles and methods applied to business, education communication, development projects, and health sciences.

280. Archaeology and the Scriptures. (3:3:0) Evening Classes only.

The Bible and the Book of Mormon compared with archaeological findings on early civilizations.

Anthropology

- 300. Biological Anthropology.** (3:3:0) W, Sp
Relationships between human biology, environment, social structure, and culture. Concepts and data on race, primates, evolution, population genetics, growth, and sociobiology.
- 301. Human Osteology.** (2:1:2)
Identification and treatment of skeletal material found in archaeological excavations.
- 305. Anthropology Theory: Materialist Approach.** (3:3:0) F, W
Major contributions to anthropological theory focusing on cultural materialism and evolutionary perspectives.
- 306. Anthropology Theory: Social, Symbolic, and Cognitive Approaches.** (3:3:0) F, W
Major contributions to anthropological theory focusing on symbolic and cognitive perspectives. Anthr 306 not sequential with 305.
- 309. Language in Culture and Society.** (3:3:0) F, W, Sp
Sociocultural categories and processes as expressed through, and determined by, language. Semiotics: language as sign system. Ethnosemantics, syntactic analysis, translation problems, ethnography of speaking/communication.
- 312. Intercultural Communication.** (3:3:0) F, W Independent Study only.
Communication processes as affected by proxemic, kinesic, linguistic, social, institutional, worldview, and value differences and other aspects of culture. Seminar/workshop: theory, research methods, applications.
- 317. Native Peoples of North America.** (3:3:0) W even yr.
Indian groups at the time of the European arrival; social organization, beliefs, values, economy, and adaptation to environment.
- 320. Anthropology of Europe.** (3:3:0) W even yr.
Europe's role in the anthropological imagination; ethnographies of contemporary European populations; themes; nationalism/postnationalism/transnationalism; postsocialism, postcolonialism, immigration; ethnic identity and cultural politics; the commodification of culture. Regional emphasis may vary.
- 326. Central American Society.** (3:2:Arr.) W
History, culture, society, and life among peoples of Mexico and Central America.
- 330. Peoples of Africa.** (3:3:0) W
Political, economic, and social organization, family life, language, worldview, religion, ritual, artistic expression, ecological adaptation, and contemporary development issues among rural and urban sub-Saharan peoples.
- 335. Peoples of India.** (3:3:0) W
Society and culture on Indian subcontinent. Stratification, kinship, marriage, religion, politics, economics.
- 340. Peoples of the Middle East.** (3:3:0) F odd yr.
Ecology, social organization, and beliefs of nomadic, rural, and urban groups between western Africa and Pakistan.
- 343. Chinese Culture and Society.** (3:3:0) F
Cultural and social institutions of traditional and modern China, including Mainland China, Taiwan, Hong Kong, or other areas of Chinese impact.
- 345. American Culture.** (3:2:Arr.) F
Unity and diversity in U.S. life. Social/cultural change processes illustrated and analyzed. Anthropological study of complex cultures. Seminar-type course involves substantial reading, writing, discussion.
- 346. Anthropology of Mormonism.** (3:3:0) W odd yr.
Intensive analysis of Mormon society and culture using a range of anthropological perspectives.
- 350. Archaeological Cultures of North America.** (3:3:0) W odd yr.
Cultural developments of North American Indians (Canada, U.S., and northern Mexico) before Columbus.
- 351. Archaeology and the Bible.** (3:3:0) F even yr., Su odd yr.
Setting and context of the Bible as clarified and supplemented from archaeology, history, and related studies. Archaeological methods.
- 355. Mesoamerican Archaeology.** (3:2:Arr.) F
Cultural-environment bases of ancient civilizations in Mexico and Central America. Olmec, Maya, Toltec, and Aztec cultures.
- 365. South American Archaeology.** (3:3:0)
Archaeological history of South America: Peru, Bolivia, and Ecuador.
- 372. Ancient Mayan Writing 1.** (3:3:0) F odd yr.
Nature and content of Mayan hieroglyphic writing, from A.D. 100 to 1600. Methods of decipherment, introduction to textual analysis, and application to interpreting Mayan language, art, world view, and society. Literacy and the Mesoamerican background of Mayan script.
- 374. Ancient Mayan Writing 2.** (3:3:0) Prerequisite: Anthr 372.
Advanced study of Mayan hieroglyphic writing. Guided workshop focusing on inscriptions, rituals, dynastic history, and linguistic records from major Mayan cities. Archaeological setting and preparation of technical commentaries emphasized.
- 378. Near Eastern Archaeology.** (3:2:Arr.) W
Peoples and culture history in Mesopotamia, Syria, Palestine, Egypt, 3500–500 B.C. Substantial reading, writing, discussion.
- 380. Historical Archaeology.** (3:2:Arr.)
Archaeological study, excavation, and restoration of sites like Nauvoo and Williamsburg. Substantial reading, writing, and discussion.
- 385. Ancient Peoples and Cultures of Europe: The Origins of European Civilization.** (3:3:0)
European culture and archaeology from initial settlement to Vikings. Agriculture, political organization, urban settlement, population movement, early astronomy, religious development. Bronze and Iron Ages, Roman expansion.
- 390R. Special Topics in Regional Anthropology.** (1–3:Arr.:0 ea.) On dem.
Subjects related to a particular area or people. Offered when unique opportunities or needs arise.
- 402. Quantitative Methods for Anthropology.** (3:3:0) F odd yr.
Quantitative methods in archaeology and sociocultural anthropology, including methods of organizing, exploring, and presenting data, probability, and statistical inference.
- 420. Language and Cultural Insight.** (3:3:0) W
Students will demonstrate language competence and increase cultural awareness using an “uncommon language.” Interview, analysis, and writing skills emphasized. Document will be in uncommon language with translation and report in English.
- 430. Moral and Ritual Institutions.** (3:3:0) F
Anthropological approaches to religion; its content and relation to other social institutions in societies ranging from gatherers to industrialists.
- 431. The Family, Marriage, and Kinship.** (3:3:0) W
Nature of kinship; parent-child, sibling, grandparental relationships. Genealogical basis of society: family, lineage, clan, kindred organization. Marital status; in-law relations; joking and avoidance behavior; divorce.
- 432. Economic and Political Institutions.** (3:3:0) F
Connections between wealth and power; political and legal systems in state and nonstate societies; expansion of capitalism and technology into remote global regions.
- 434. Medical Anthropology.** (3:3:0) W even yr. Recommended: Anthr 247.
Interactions between culture and health in comparative perspective, emphasizing social, historical, and ecological determinants.

435. The Anthropology of Art: Images, Ideas, and Craft in the Non-Western World. (3:3:0)

Comparative study of Western and non-Western traditions of beauty, artistic creation, images, myth, and ritual. Social, semiotic, and political functions of art. Colonial and modern interactions.

436. Symbolic Anthropology. (3:3:0) W

Social use and understanding of semiotics, signs, symbols, and other meaningful forms as critically constitutive of culture.

437. Men, Women, and the Culture of Gender. (3:3:0) F odd yr. Recommended: Anthr 247.

Gender roles across culture relative to health, ethnicity, economic development, kinship, war, etc.

438. Social Stratification and Complex Societies. (3:3:0)

Anthropological consideration of organized social inequality, focusing on class, caste, gender, and ethnicity.

440. Small-Scale Societies. (3:3:0)

Ethnographic and archaeological studies of band and tribal societies (hunter-gatherers and simple farmers) from around the world.

441. Anthropology of Development. (3:3:3) W even yr.

Theory, practice, and research methods regarding the anthropological study and resolution of poverty, disease, malnutrition, displacement, and inadequate educational opportunities.

442. Ethnographic Skills. (3:2:Arr.) F, Sp

Methods, rationale, limitations, and ethical issues of participant observation, interviewing, quantitative measurement, and other procedures of ethnographic fieldwork. Local field project.

450. Seminar in Anthropology of Education. (3:3:0) W odd yr. Prerequisite: Anthr 101, 405.

Anthropological theories of and qualitative research in child rearing, enculturation, cognition, informal education, schools, literacy, multicultural and multilingual education, and cultural transmission and acquisition.

454R. Field School Preparation. (1:1:1 ea.) W Prerequisite: major status.**455R. Field School of Archaeology.** (1–6:0:Arr. ea.) Sp Prerequisite: Anthr 454R; major status.

Training and experience in excavation at a BYU-sponsored dig.

456R. Lab Skills for Anthropology. (2–6:Arr.:Arr. ea.) F Prerequisite: Anthr 455R; major status.

Analytical and laboratory techniques as part of a BYU-sponsored archaeological project.

490R. Special Topics in Theory and System. (3:3:0 ea.) On dem.

Subjects related to anthropological theory or the operation of social systems. Offered when unique opportunities or needs arise.

495. Ethnographic Field Project. (6:0:Arr.) Sp Prerequisite: Anthr 442.

Conduct field work, maintain field notes, and write a paper incorporating both descriptive and analytic components.

496R. Academic Internship: Research. (1–3:Arr.:Arr. ea.) Prerequisite: supervising instructor's consent.

Field or library research.

497. Directed Readings. (3:Arr.:0) Prerequisite: major status; supervising instructor's consent.

Reading 2,500 pages on a stated topic.

499R. Senior Thesis. (3:3:0 ea.) F Prerequisite: Anthr 495.

Supervised analysis and write-up of data generated during field project.

500-Level Graduate Courses (available to advanced undergraduates)

Undergraduate BYU anthropology students may enroll in some of the following courses if they have completed 30 hours in their major.

501. Archaeological Systematics. (3:3:0) F

Major contributions and current development in archaeological method and theory.

502. Quantitative Methods for Anthropology. (3:3:0) F odd yr.

Methods of organizing, exploring, and presenting data, probability, and statistical inference.

510. History of Archaeology. (3:3:0) W odd yr.

Historical approach to development of archaeological knowledge, method, and theory, emphasizing North America and individual contributions.

511. Museums and Cultures. (3:3:0) F even yr.

Museums in society. Cultural foundations of museum content and sociology of museum use. Analyzing museum studies literature with on-site visits to area museums.

512. Heritage Resource Management. (3:3:0) F Prerequisite: admittance into graduate program in archaeology or certificate program in museum practices.

Legal and ethical issues for practicing archaeologists. Preservation law, collections law, public archaeology, Native American issues, and careers in archaeology and museums.

522. Museum Practices and Technologies. (3:3:Arr.) F odd yr.

Core museum disciplines: collections management, curation, education, exhibition, and conservation. Supporting technologies: database, digital photography, Web design, etc. Career paths.

524. Museology: Curation and Writing. (3:3:Arr.) F even yr.

Prerequisite: admission to certificate in museum practices program.

Professional practices supporting the educational, research, and reporting functions of museums, emphasizing museum writing leading to publication, cataloguing, policy writing, exhibition conceptualization, etc.

525. Museum Registration and Collections Management. (3:3:Arr.) W even yr.

Managing anthropological collections: object-handling, object-tracking, accessioning, deaccessioning, collections databases, loans, valuating collections, conservation environments, ethics, and NAGPRA and other laws relating to museums.

526. Museum Exhibitions and Programming. (3:1:8) W odd yr.

Prerequisite: admission to certificate in museum practices program; Anthr 524.

Instruction and practica in all aspects of exhibition development. Current thought and literature in museum education with practica for application.

530. Great Basin Archaeology. (3:3:0) W even yr.

Overview of ethnography, history of research, and prehistory of the Great Basin culture area. Current issues in archaeological research emphasized.

535. Southwest Seminar. (3:3:0) W odd yr.

Overview of ethnography and prehistory of American Southwest. Current issues in archaeological research emphasized.

540. Issues in Historic Archaeology. (3:3:0) Prerequisite: Anthr 380 or equivalent.

In-depth review of issues, trends, and methods of historic archaeology.

550. (Anthr-Ling) Sociolinguistics. (3:3:0) W even yr.

Research and theory in anthropological linguistics and sociolinguistics.

551. (Anthr-Ling) Anthropological Linguistics. (3:3:0) F even yr.

Language in culture and society: development, typology, and description.

Anthropology

560. Comparative Mayan Linguistics. (3:3:0)

Grammatical, semantic, lexical, and phonological issues in comparative Mayan. Historical linguistics of Mayan language family. Languages relevant to understanding classic Mayan language and script emphasized.

562. Formative Mesoamerica. (3:3:0) F odd yr.

Topics and issues concerning beginnings and development of Mesoamerican civilizations. Mexican and Mayan antecedents of classic Mayan civilization and culture.

564. Classic Mayan Civilization. (3:3:0) W odd yr.

Topics and issues concerning archaeological and cultural aspects of classic Mayan civilization and society.

565. Mayan Ceramic Analysis. (3:3:0) W even yr.

Current approaches to classification and analysis of archaeological ceramics, particularly Maya Lowland pottery. Laboratory study of actual pottery collections from the Maya area.

566. Mayan Ethnohistory. (3:3:0)

Topics and issues of cultural change, colonization, and documentation of change processes in the Mayan region, from postclassic period and independence from Spain.

572. Ancient Mayan Writing 1. (3:3:0)

Nature and content of Mayan hieroglyphic writing, from A.D. 100 to 1600. Methods of decipherment, introduction to textual analysis, and application to interpreting Mayan language, art, world view, and society. Literacy and the Mesoamerican background of Mayan script.

574. Ancient Mayan Writing 2. (3:3:0) Prerequisite: Anthr 372 or 572.

Advanced study of Mayan hieroglyphic writing. Guided workshop focusing on inscriptions, rituals, dynastic history, and linguistic records from major Mayan cities. Archaeological setting and preparation of technical commentaries emphasized.

575. Writing Systems. (3:3:0)

Comparative study of writing around the world, emphasizing ancient scripts. Topics include: linguistic concepts; social, political, and economic function of early script; ancient literacy; development and extinction of script.

580. Near East Seminar. (3:3:0) F even yr.

Current issues in Near Eastern archaeological research.

590R. Special Topics. (3:3:Arr. ea.) On dem.

Special topics in archaeology or museum studies.

596. Museum Projects. (3:0:8) Sp odd yr. Prerequisite: admission to certificate in museum practices program; Anthr 524, 526.

One or more supervised museum projects, such as producing an exhibition, developing educational materials, conducting inventory, or accessioning collections.

599R. Academic Internship: Federal Agency or Museum/Collections Repository. (1–6:0:0 ea.) Prerequisite: prior approval; completion of all course work for certificate in museum practices (may be taken concurrently with Anthr 596).

Earning credit while employed in federal agency archaeology (BLM, U.S. Forest Service, etc.); or 320 hours in collections-holding institution (sixteen weeks half-time or eight weeks full-time).

Graduate Courses

For 600- and 700-level courses, see the BYU 2006–2007 Graduate Catalog.

Anthropology Faculty

Professors

Clark, John E. (1990) BS, MA, Brigham Young U., 1976, 1979; PhD, U. of Michigan, 1994.

Forsyth, Donald W. (1979) BA, MA, Brigham Young U., 1971, 1972; PhD, U. of Pennsylvania, 1979.

Hawkins, John P. (1974) BS, Brigham Young U., 1970; MA, PhD, U. of Chicago, 1972, 1978.

Janetski, Joel C. (1983) BA, Brigham Young U., 1965; MA, PhD, U. of Utah, 1977, 1983.

Associate Professors

Crandall, David P. (1994) BA, Brigham Young U., 1986; MPhil, DPhil, Oxford U., England, 1989, 1993.

Johnson, David J. (1987) BA, MA, PhD, U. of Utah, 1972, 1982, 1987.

Assistant Professors

Allison, James R. (2004) BA, MA, Brigham Young U., 1985, 1990; PhD, Arizona State U., 2000.

Hartley, Julie (2001) BA, Brigham Young U., 1992; MA, Utah State U., 1994; PhD, Columbia U., 2001.

Adjunct Faculty

Allen, Marti Lu (1992) BA, U. of Missouri, Columbia, 1975; AM, PhD, U. of Michigan, 1978, 1985.

Andrus, Edwin K. (1981) BA, MA, Brigham Young U., 1971, 1973.

Buonforte, Richard H. (1990) BA, Brigham Young U., 1982; MA, MPhil, Yale U., 1984, 1985.

Olsen, Steven L. (1992) BA, Brigham Young U., 1975; AM, PhD, U. of Chicago, 1978, 1985.

Emeriti

Matheny, Ray T. (1964) BA, MA, Brigham Young U., 1960, 1962; PhD, U. of Oregon, 1968.

Sorenson, John L. (1971) BS, MA, Brigham Young U., 1951, 1952; MS, California Inst. of Technology, 1952; PhD, U. of California, Los Angeles, 1961.

Armenian

See Center for Language Studies.

Art

See Visual Arts.

Asian and Near Eastern Languages

Robert A. Russell, Chair
3064C JFSB, (801) 422-6405

College of Humanities Advisement Center
1175 JFSB, (801) 422-4789

Admission to Degree Program

All degree programs in the Department of Asian and Near Eastern Languages are open enrollment. Some special limitations apply for teaching minors.

The Discipline

The many countries of Asia and the Near East are among the oldest civilizations in the world. The study of the languages and cultures of these nations gives students access to some of the richest and most varied traditions of thought, belief, and behavior to be found in the world. A large percentage of the vast, essentially non-Christian segment of the world's population resides in these two zones: Asia—with its diverse heritage of belief in Hinduism, Buddhism, Taoism, Confucianism, and other systems of thought—continues to retain its “exotic” image for most Westerners, even though many nations in the region are at the forefront of contemporary politics and economics. The Near East, birthplace of Christianity, Judaism, and Islam, remains a little-understood, often stereotyped area of considerable economic, strategic, and religious importance today.

The languages of these regions are themselves generally difficult, with complex writing systems that require diligent study. But exposure to these languages and the cultures they express will enable students to look at the world from new perspectives and deepen their understanding of peoples whose history and practices are widely divergent from their own.

Courses in the department equip students with verbal and written facility in the languages of their chosen area, whereas linguistics courses offer an understanding of how the languages are structured and acquired. A study of the literature reveals old and sophisticated traditions no less important than that of English or any other major language.

Majors are available in Chinese, Japanese, and Korean. Students can obtain a minor in Arabic and Hebrew. Each major discipline is briefly described below.

Chinese (Cantonese and Mandarin)

The study of Chinese accesses the literature, thought, culture, and society of the world's largest population with the longest cultural continuum; moreover, since the civilizations of Japan, Korea, and Vietnam are founded on traditional Chinese Confucianism, a major in Chinese opens up much of the wider world of modern Asia. You will communicate in spoken and written Mandarin, gain skills in analyzing and appreciating both traditional and modern literature, acquire effective research strategies, and learn to write clearly and persuasively. All the personal enrichment and interpersonal understanding that results from a liberal arts education in the humanities is offered through the study of Chinese.

Japanese

Although Japan's economic successes are widely recognized, few people know much about the rich cultural heritage of Japan in literature, thought, painting, music, and the other arts. The study of Japanese language and literature will introduce you to many of the major aspects of that heritage while providing the kind of training in language and social skills that will prepare you to undertake careers in a wide variety of fields. The study of Japanese at the university level is aimed at providing you with advanced language skills and a sophisticated understanding of Japan and its people acquired through an examination of the literature and culture.

Korean

Korean is a difficult language, and at BYU we emphasize reading and writing the language as well as speaking and listening. Basic course work emphasizes linguistic skill and the language's literary value and tradition.

Note: Instruction is also regularly available in Hebrew and Arabic.

Career Opportunities

Students who major or minor in the languages and cultures of Asia and the Near East will find that, as will any other humanities-centered course of study, they have been well provided with tools to communicate both in the target language and in English and have broadened and deepened their knowledge of the region of their choice. Career options are many and varied for such students, but those who do not plan to continue on in the academic study of the language are strongly urged to consider a second major or a strong minor in a practical field that can be combined with their language skills. In the competitive world of today, language ability alone no longer provides the competitive advantage it once offered on the job market. Students are urged to consult the College of Humanities Advisement Center, Job Search Assistance, and their academic advisors for the best ways to make use of their language as they begin to seek employment.

Chinese

Chinese majors have all of the advantages of the liberal arts graduate (who claims effective communication and interpersonal skills) with the added edge of knowing the language and culture behind a leading world economy. Therefore, graduates enter the work force in a wide variety of occupations, such as journalism, insurance, business, travel, investment, and government service. They not only are marketable as trained linguists, translators, and cultural advisors, but are vigorously recruited as personnel managers and business representatives by companies with overseas interests. Graduates are also highly competitive in applying to professional schools for medicine, dentistry, law, and business.

Japanese

In recent years, graduates from the Japanese major at BYU have gone on to law, engineering, computer, or MBA programs, while others have continued on to medical school. A few have pursued graduate work in a variety of academic fields at some of the most prestigious universities in the country. Others have gone directly to work in government service, in the military, and in American or Japanese business firms where their language ability and cultural background are in high demand.

Korean

Most of the jobs available for students with a Korean major are in government (NSA, CIA, FBI), etc., but Korean majors also have all the advantages of a liberal arts degree. Many of our graduates go on to professional schools, law, business, or medicine. Korean is an excellent complement, either as a major or minor, to studies in prelaw, political science, accounting, English, international relations, and many other majors available on campus. Korean is an important language in the world of diplomacy and defense, as well as the world of international business. (Korea is the eighth largest trading partner of the U.S.) Our graduates have been hired by the U.S. government and by U.S., international, and Korean businesses. They work in technical areas as well, involving everything from computers to broadcasting to medicine.

General Information

The Department of Asian and Near Eastern Languages strongly recommends that StDev 317, a 1-credit-hour course, be taken at the end of the sophomore year or the beginning of the junior year. Because liberal arts degrees provide preparation in a variety of useful fields rather than a single career track, this course is recommended to help liberal arts students focus on specific

Asian and Near Eastern Languages

educational and occupational goals and to identify the career options or educational opportunities available to them. The course will introduce them to the resources needed for accessing information about graduate schools, internships, careers, and career development. Students will learn basic employment strategies, including the steps necessary for obtaining employment related to their own specialty.

Graduation Requirements

To receive a BYU bachelor's degree a student must complete, in addition to all requirements for a specific major, the following university requirements:

- The university core, consisting of requirements in general and religious education (See the University Core section of this catalog for details. For a complete listing of courses that meet university core requirements, see the current class schedule.)
- A minimum of 30 credit hours in residence
- A minimum of 120 credit hours
- A cumulative GPA of at least 2.0

Undergraduate Programs and Degrees

BA	Chinese
BA	Japanese
BA	Korean
Minors	Arabic
	Chinese
	Chinese Teaching
	Hebrew
	Japanese
	Japanese Teaching
	Korean

Students should see their college advisement center for help or information concerning the undergraduate programs.

Graduate Programs and Degrees

MA	Language Acquisition (Arabic, Chinese, Japanese, or Korean)
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For more information see the BYU 2006–2007 Graduate Catalog.

General Information

Language Credit by Examination

Credit by examination is available for many lower-division courses of the above-listed languages. Enrollment in an advanced class is prerequisite to taking the examination.

The following languages are *not* taught on a regular basis but may be offered if sufficient demand exists. Credit by examination is available for some of the Near Eastern languages listed below.

Akkadian
Aramaic
Egyptian
Persian (Farsi)
Syriac
Turkish
Ugaritic

Arabic

Minor Arabic (18–35 hours*)

Minor Requirements

1. Complete the following prerequisite courses (or equivalents): Arab 101, 102, 201, 202.
2. Complete the following (normally as part of a BYU Semester Abroad program): Arab 211R, 300, 302, 311R, and one additional Arabic language course.

3. Complete the following:
Hum 242.

*Hours include courses that may fulfill university core requirements.

Arabic (Arab)

Undergraduate Courses

100. Introduction to Arabic. (1:1.5:0)

Beginning Arabic. Offered at the Jerusalem Center for Near Eastern Studies only.

101. First-Year Arabic. (4:5:0)

Basic skills of spoken and written Arabic. Suggested first class for students learning Arabic.

102. First-Year Arabic. (4:5:0) Prerequisite: Arab 101.

Second-semester Arabic. Basic language skills, both spoken and written.

201. Second-Year Arabic. (4:5:0) F, Su Prerequisite: Arab 102 or equivalent experience.

Significantly expanding proficiency in Modern Standard Arabic and increasing conversational repertoire.

202. Intermediate Arabic. (4:5:0) W, Su Prerequisite: Arab 201 or equivalent experience.

Continuation of Arab 201.

211R. Second-Year Conversation. (2:2:0 ea.) Prerequisite: Arab 102 or equivalent experience.

Intermediate spoken Arabic.

300. Advanced Modern Standard Arabic. (4:5:0) Prerequisite: Arab 202.

Advanced work in reading, writing, listening, and speaking.

302. Newspaper Arabic. (4:5:0) Prerequisite: Arab 300.

Extensive reading of Arabic newspapers and magazines, with appropriate vocabulary building.

311R. Third-Year Conversation. (2:2:0 ea.) Prerequisite: Arab 201, 211R, or equivalent experience.

Advanced conversation skills.

331. Spoken Arabic. (4:5:0) Prerequisite: Arab 311R or equivalent experience.

Intensive study of the spoken language.

361. Introduction to Modern Arabic Literature in Translation. (3:3:0)

Reading and discussion of representative sample of modern Arabic short stories, novels, plays, and poetry. All readings in English.

362. Introduction to Medieval Arabic Literature in Translation. (3:3:0)

Reading and discussion of representative sample of medieval Arabic literature. All readings in English.

431. Spoken Arabic—Egyptian Dialect. (4:5:0) Prerequisite: Arab 331 or equivalent experience.

Introduction to colloquial literature.

453. Readings in the Social Sciences. (3:3:0) Prerequisite: Arab 302.

Reading of original Arabic sources in political science, history, international relations, and other social science fields.

461. Survey of Modern Arabic Literature. (3:3:0) Prerequisite: Arab 302.

Reading and discussion of representative sample of modern Arabic short stories, novels, plays, and poetry.

462. Survey of Medieval Arabic Literature. (3:3:0) Prerequisite: Arab 302.

Reading and discussion of representative sample of medieval Arabic literary works, including poetry, 'Adab literature, Maqaamaat, folk literature, travel literature, biography, philosophy, and history.

471. The Structure of Arabic. (3:3:0) Prerequisite: Arab 302.

Arabic phonology, morphology, syntax, and semantics, with a review of current scholarship in Arabic linguistics.

490R. Independent Readings. (1–3:Arr.:0 ea.) Prerequisite: instructor's consent.

Independent readings of Arabic materials.

500-Level Graduate Course (available to advanced undergraduates)

531R. Advanced Topics in Arabic. (1–3:5:0 ea.) Prerequisite: instructor's consent.

Advanced studies in Arabic language and literature.

Graduate Courses

For 600- and 700-level courses, see the BYU 2006–2007 Graduate Catalog.

Chinese

BA Chinese (41–53 hours*)

Major Requirements

1. Complete the following prerequisite courses (or equivalents):
Chin 101, 102, 201.
2. Complete the following:
Chin 202, 301, 302, 321, 322, 495.
3. Complete one course from the following:
Chin 343, 344.
4. Complete one course from the following:
Chin 325, 326.
5. Complete three courses from the following:
Chin 441, 442, 443, 444.
6. Complete 6 additional hours required from upper-division Chinese. It is mandatory that students consult with their advisor to determine supporting courses appropriate to professional goals.

*Hours include courses that may fulfill university core requirements.

Minor Chinese (22–39 hours*)

Minor Requirements

1. Complete the following prerequisite courses (or equivalents):
Chin 101, 102, 201, 202.
2. Complete the following:
Chin 301, 302, 441.
3. Complete one course from the following:
Chin 443, 444.
4. Complete one course from the following:
Chin 321, 322.
5. Complete one course from the following:
Chin 343, 344.
6. Complete one additional class above 301.

*Hours include courses that may fulfill university core requirements.

Minor Chinese Teaching (26–42 hours*)

Minor Requirements

1. Complete the following prerequisite courses (or equivalents):
Chin 101, 102, 201, 202.
2. Complete the following:
Chin 301, 302, 326, 377, 441.
3. Complete one course from the following:
Chin 321, 322.
4. Complete one course from the following:
Chin 443, 444.
5. Complete one course from the following:
Hist 339R, 340.

*Hours include courses that may fulfill university core requirements.

Chinese—Mandarin (Chin)

Undergraduate Courses

101. Beginning Mandarin. (4:5:2)

Basic grammar, vocabulary building, speaking.

102. Beginning Mandarin. (4:5:2) Prerequisite: Chin 101 or equivalent.

Continuation of Chin 101.

112. Beginning Chinese Reading. (2:2:0) Prerequisite: equivalent of one year spoken Mandarin skills.

Chinese writing system, reading, and basic composition using Chinese characters.

200R. Chinese Calligraphy. (2:0:2 ea.) Prerequisite: Chin 101 or equivalent.

Training in the art of writing Chinese characters with a brush.

201. Intermediate Mandarin. (4:5:1) Prerequisite: Chin 102.

Advanced grammar, the writing system, reading and writing, speaking.

202. Intermediate Mandarin. (4:5:1) Prerequisite: Chin 201.

Advanced grammar, the writing system, reading and writing, speaking.

211R. Intermediate Conversation. (2:2:1 ea.) Prerequisite: Chin 102.

Emphasis on fluency and vocabulary building.

301. Third-Year Mandarin. (4:5:1) Prerequisite: Chin 202.

Discourse grammar, advanced reading.

302. Third-Year Mandarin. (4:5:0) Prerequisite: Chin 301.

Advanced-level Mandarin skills, especially media discourse and reading.

311R. Advanced Conversation. (2:2:1 ea.) Prerequisite: Chin 202 or equivalent.

Emphasis on sophistication of speech.

321, 322. Selected Readings of Modern Chinese. (3:3:0 ea.)

Prerequisite: Chin 302.

Complements overall language competency through reading modern texts selected from a wide range of styles and genres.

325. Structure of Chinese. (3:3:0) Prerequisite: Chin 202.

Sound, syntax, meaning, and word structure of Mandarin Chinese and its implications to problems of learning Chinese.

326. Introduction to Chinese Linguistics. (3:3:0) Prerequisite: Chin 202.

Dialectology, phonology, syntax, semantics, discourse, morphology, and sociolinguistics.

Asian and Near Eastern Languages

327. Chinese Translation and Interpretation. (3:3:0) Prerequisite: Chin 301.

Translation techniques, with practice in oral and written translation either from Chinese to English or from English to Chinese.

343. Chinese Literature in Translation—Poetry. (3:3:0)
All readings in English; topics vary.

344. Chinese Literature in Translation—Prose. (3:3:0)
All readings in English; topics vary.

345R. Chinese Culture. (3:3:0)
Selected topics in traditional, modern, and contemporary Chinese culture.

346. Introduction to Chinese Philosophy. (3:3:0) W Alt. yr.
Introduction to native Chinese philosophies of Confucianism and Taoism. Readings in translation of *Lun-yu*, *Meng-tsu*, *Lao-tzu*, and *Chuang-tzu*. Themes include self, society, and cosmos.

347. Business Chinese. (3:3:0) Prerequisite: Chin 301 or instructor's consent.

Introduction to terminology and format of business communication in Chinese, emphasizing both reading and writing of various forms of business communication.

377. Chinese Language Teaching Procedures. (3:3:0) Prerequisite: Chin 325 or 326 or instructor's consent.
Acquiring knowledge and skills specific to teaching Chinese as a foreign language. Conducted in Chinese and English.

399R. Academic Internship. (1–9:0:0 ea.) Prerequisite: Chin 202.
On-the-job cultural and/or language experience.

441, 442. Classical and Literary Chinese. (3:3:0 ea.) Prerequisite: for 441: Chin 301 or equivalent; for 442: Chin 441.
Introduction to syntax and stylistic patterns.

443. Modern Chinese Literature. (3:3:0) Prerequisite: Chin 321 or 322.
Authors, themes, and writing styles of the period 1915–1949. Texts in Chinese.

444. Contemporary Chinese Literature. (3:3:0) Prerequisite: Chin 321 or 322.
Contemporary literature of Taiwan and the PRC. Texts in Chinese.

445R. Chinese Poetry. (3:3:0) Prerequisite: Chin 343, 441.
Readings in Chinese poetry. Topics vary from classical and modern poetry. Various themes and genres introduced, emphasizing shi poetry. Texts in Chinese.

490R. Individual Study in Chinese. (1–3:Arr.:0 ea.) Prerequisite: project approval by instructor.
Assignments to fit individual needs of the advanced student.

495. Senior Seminar for Majors. (2:2:0) Prerequisite: advanced knowledge of Chinese.
Research methods in Chinese language sources. Paper required.

500-Level Graduate Course (available to advanced undergraduates)

599R. Academic Internship. (1–9:0:0 ea.) Prerequisite: coordinator's and department's consent.
On-the-job cultural and/or language experience.

Graduate Courses

For 600- and 700-level courses, see the BYU 2006–2007 Graduate Catalog.

Chinese—Cantonese (Cant)

Undergraduate Courses

101. First-Year Cantonese. (4:5:0)
Basic language skills.

102. First-Year Cantonese. (4:5:0)
Basic language skills.

201. Second-Year Cantonese. (4:5:0) Prerequisite: Cant 102 or foreign residence experience.
Grammatical patterns and vocabulary of spoken and written Cantonese.

202. Second-Year Cantonese. (4:5:0) W Prerequisite: Cant 201 or equivalent.
Intermediate to advanced skills in reading, writing, listening, and speaking.

211R. Second-Year Conversation. (2:2:0 ea.) Prerequisite: Cant 201 or foreign residence experience.
Intermediate listening comprehension and speaking skills.

Hebrew

Minor Hebrew (18–28 hours*)

Minor Requirements

1. Complete one of the following prerequisite options (or equivalents):

Modern Hebrew track:

- Complete the following:
Heb 101, 102.
- Complete one course from the following:
Heb 132, 134.

Ancient Hebrew track:

- Complete one course from the following:
Heb 131, 133.
- Complete one course from the following:
Heb 132, 134.
- Complete the following:
Heb 102.

Note: Students should complete Heb 131/133 and Heb 132/134 *before* Heb 102.

- Complete the following:
Heb 201.
- Complete one course from the following:
Heb 313, 331.
- Complete one course from the following:
Heb 421, 431.
- Complete one course from the following:
Heb 202, 312.
- Complete 4 hours from the following:
ANES 363.
Heb 311R, 411R, 432R, 441, 444.

*Hours include courses that may fulfill university core requirements.

Hebrew (Heb)

Undergraduate Courses

100. Introduction to Hebrew. (1:1.5:0)
Beginning Hebrew; offered at the Jerusalem Center for Near Eastern Studies only.

101, 102. First-Year Hebrew. (4:5:2 ea.)
Modern Hebrew as spoken in Israel today.

131, 132. First-Year Biblical Hebrew. (4:5:0 ea.) Independent Study also.
Old Testament Hebrew. Provides foundation in grammar and vocabulary; reading Hebrew prose texts in Bible.

133, 134. Honors Hebrew and the Old Testament. (4:4:0 ea.)

Rapid survey of biblical Hebrew. Must be taken in conjunction with specified Honors section of Rel A 301 and 302.

201. Second-Year Modern Hebrew. (4:5:0) Prerequisite: Heb 102 or equivalent.

202. Intermediate Readings. (4:4:0) Prerequisite: Heb 201 or equivalent.

311R. Intermediate Conversation. (2:2:0 ea.) Prerequisite: Heb 201.

312. Hebrew Media. (4:4:4) Prerequisite: Heb 101, 102.

Emphasizes reading, aural comprehension, and speaking Hebrew. Includes newspaper reading, listening to local news on radio and television, and in-class discussion of current events. Offered at the Jerusalem Center for Near Eastern Studies only.

313. Readings in the Old Testament. (3:3:0)

Readings in the Old Testament in Hebrew. Offered at the Jerusalem Center for Near Eastern Studies only.

321. Intermediate Conversation and Media. (3:3:0) W alt yr. Prerequisite: Heb 101, 102.

Capitalizing on daily life in Jerusalem to increase speaking, reading, writing, and listening comprehension in modern Hebrew. Offered at the Jerusalem Center for Near Eastern Studies only.

331. Readings in the Hebrew Scriptures 1. (4:5:0) Prerequisite: Heb 132, 201, or equivalent.

Grammar review and vocabulary building through reading historical and prophetic books.

411R. Advanced Conversation. (4:4:4) Prerequisite: Heb 311R or equivalent.

Emphasizes conversation in everyday situations. Students role play various situations in class and then apply their learning in Jerusalem. Offered at the Jerusalem Center for Near Eastern Studies only.

421. Readings in the Hebrew Translation of the New Testament. (3:3:0)

Readings in the New Testament in Hebrew translation. Offered at the Jerusalem Center for Near Eastern Studies only.

431. Readings in the Hebrew Scriptures 2. (4:4:0) Prerequisite: Heb 331.

Readings in the poetic and wisdom literature.

432R. Ancient Hebrew Texts. (2:2:0 ea.) F, W Prerequisite: Heb 331.

441. Postbiblical Hebrew: Mishnah. (2:2:0) Prerequisite: Heb 331.

Introduction to the grammar of Mishnaic Hebrew. Readings from various tractates of the Mishnah.

444. Postbiblical Hebrew: Modern Hebrew Biblical Commentaries. (2:2:0) Prerequisite: Heb 331.

Readings in commentaries on the Hebrew scriptures in modern Hebrew.

Japanese

BA Japanese (38–50 hours*)

Major Requirements

1. Students will be required to sit a comprehensive language exam covering grammar and Joyo Kanji.
2. A required reading list must be completed, evidenced by successful completion of Japan 492, normally during the last semester before graduation.
3. Counsel with advisor to determine supporting courses appropriate to your professional goals.
4. Complete the following prerequisite courses (or equivalents): Japan 101, 102, 201.

5. Complete one course from the following: Japan 202, 221.

6. Complete the following: Japan 301, 311R, 321, 322, 441, 443, 444, 492.

7. Complete one course from the following: Japan 325, 326.

8. Complete one course from the following: Japan 350, 351, 352.

9. Complete 6 hours from the following: Japan 325, 326, 345, 350, 351, 352, 377.

(Optionally, one of the following may be substituted for Japan 345: Hist 343, 344, Pl Sc 354, 386, Japan 390.)

Recommended Courses

It is recommended that students complete Engl 311 or similar courses before enrolling in advanced literature courses.

*Hours include courses that may fulfill university core requirements.

Minor Japanese (16–28 hours*)

Minor Requirements

1. Complete the following prerequisite courses (or equivalents): Japan 101, 102, 201.
2. Complete one course from the following: Japan 202, 221.
3. Complete the following: Japan 301, 311R, 321, 322.

*Hours include courses that may fulfill university core requirements.

Minor Japanese Teaching (25–37 hours*)

Minor Requirements

1. Complete the following prerequisite courses (or equivalents): Japan 101, 102, 201.
2. Complete one course from the following: Japan 202, 221.
3. Complete the following: Japan 301, 311R, 321, 322, 377.
4. Complete one course from the following: Japan 325, 326.
5. Complete one course from the following: Japan 345, 350, 351, 352.

*Hours include courses that may fulfill university core requirements.

Japanese (Japan)

Undergraduate Courses

101, 102. First-Year Japanese. (4:5:1 ea.) Prerequisite: for 102, Japan 101, or equivalent.

Writing systems, grammar and vocabulary-building fundamentals, basic conversation and reading. Includes introduction to Chinese characters in 102.

201. Second-Year Japanese. (4:5:2) Prerequisite: Japan 102 or equivalent.

Further practice in conversation; basic reading and writing skills.

Asian and Near Eastern Languages

202. Second-Year Japanese. (4:5:0) Prerequisite: Japan 201 or equivalent.

Further practice in conversation, reading, and writing; introducing culture through short stories, articles. Not for returned missionaries.

211R. Second-Year Conversation. (1–3:Arr:0 ea.) For Japan Study Abroad or Foreign Language Housing students only. Prerequisite: Japan 102 or equivalent.

221. Japanese Reading, Grammar, and Culture. (4:5:0)

Prerequisite: Japan 201 or equivalent.

Reading and writing emphasizing essential characters, vocabulary, grammar, and culture. First course for returned missionaries.

301. Readings in Japanese History and Literature. (4:5:0)

Prerequisite: Japan 202, 221, or instructor's consent.

Readings in Japanese history and literature with essential characters, vocabulary, and grammatical principles.

311R. Third-Year Conversation. (2:2:0 ea.) Prerequisite: Japan 202, 221; or instructor's consent.

May be repeated for Study Abroad in Japan.

321. Selected Readings and Grammar. (3:3:0) Prerequisite: Japan 301 or equivalent.

Readings in modern documentary styles, emphasizing reading comprehension, grammar, and vocabulary building.

322. Selected Readings and Grammar. (3:3:0) Prerequisite: Japan 301 or equivalent.

Readings in modern short fiction, emphasizing grammar, reading comprehension, vocabulary building, and stylistic analysis.

325. Japanese Morphology, Syntax, and Semantics. (3:3:0)

Prerequisite: Japan 301.

General overview of grammar and its practical application in composition.

326. Contrastive Analysis of Japanese and English. (3:3:0)

Prerequisite: Japan 301.

Contrastive overview of Japanese and English phonology, syntax, semantics, and discourse.

345. Japanese Culture. (3:3:0)

General survey emphasizing aesthetics, religion, and value systems. All readings in English.

350. Japanese Literature in Translation—Eighth Through Sixteenth Centuries. (3:3:0)

Reading and discussing selected topics in Japanese literature (narrative, lyric, drama) from 700 through 1600 (Nara, Heian, and medieval periods).

351. Japanese Literature in Translation—Seventeenth Through Nineteenth Centuries. (3:3:0)

Reading and discussing selected topics in Japanese literature (narrative, lyric, drama) from 1600 through 1900 (Edo and Meiji periods).

352. Japanese Literature in Translation—The Modern Era. (3:3:0)

Reading and discussing selected topics in Japanese literature (narrative, lyric, drama) from Meiji period to the present.

377. Japanese Language Teaching Procedures. (3:3:0) Prerequisite: Japan 301 or instructor's consent.

Acquiring knowledge and skills specific to teaching of Japanese as a foreign language. Conducted in Japanese and English.

390. Japanese for Special Purposes. (3:3:0) Prerequisite: Japan 321 or equivalent.

Readings, video materials, discussions, and projects in content areas related specifically to business, science, and technology.

399R. Academic Internship. (1–9:0:0 ea.) Prerequisite: Japan 301.

On-the-job cultural and/or language experience.

441. Introduction to Classical Japanese. (3:3:0) Prerequisite: Japan 321 or 322.

Reading of premodern texts, emphasizing grammar and syntax, and showing differences from and influences on the modern idiom.

443. Advanced Readings and Grammar. (3:3:0) Prerequisite: Japan 322 or equivalent.

Reading and discussion of modern expository texts; developing advanced listening skills using authentic materials.

444. Modern Japanese Literature. (3:3:0) Prerequisite: Japan 321, 322; or equivalents.

Fictional texts from major twentieth-century authors. Texts primarily in Japanese.

490R. Individual Study in Japanese. (1–3:Arr:0 ea.) Prerequisite: consent of advisor and instructor.

Topics vary. Assignments to fit individual needs of the advanced student.

492. Majors' Reading List. (1:1:Arr.) Prerequisite: department approval.

Guided reading course to meet reading list requirement. Required of all majors.

500-Level Graduate Course (available to advanced undergraduates)

599R. Academic Internship. (1–9:0:0 ea.) Prerequisite: Japan 301.

On-the-job cultural and/or language experience.

Graduate Courses

For 600- and 700-level courses, see the BYU 2006–2007 Graduate Catalog.

Korean

BA Korean (37–53 hours*)

Major Requirements

1. Complete the following prerequisite courses (or equivalents):
Korea 101, 102, 201, 202.
2. Complete the following:
Hist 346.
Korea 301, 302, 321, 325, 340, 401, 402, 443, 495.
3. Complete 6 hours from the following:
Korea 311R, 344R, 345, 399R, 427, 441, 471, 490R.

Recommended

Prospective majors are urged to have a concurrent major or minor in another discipline.

*Hours include courses that may fulfill university core requirements.

Minor Korean (16–33 hours*)

Minor Requirements

1. Complete the following prerequisite courses (or equivalents):
Korea 101, 102, 201, 202.
2. Complete the following:
Korea 301, 302, 321, 340.
3. Complete one course from the following:
Bus M 596.
Korea 311R or higher.

*Hours include courses that may fulfill university core requirements.

Korean (Korea)**Undergraduate Courses**

- 101. First-Year Korean 1.** (4:5:0) F
Han'qul, the phonetic system, basic grammar and vocabulary, discourse, reading, and culture.
- 102. First-Year Korean 2.** (4:5:0) Prerequisite: Korea 101 or equivalent.
Continuation of Korea 101. Phonetic system, basic grammar, vocabulary, discourse, reading, and culture.
- 201. Second-Year Korean 1.** (4:5:0) F Prerequisite: Korea 102 or equivalent.
Further practice in discourse and basic reading and writing skills; culture.
- 202. Second-Year Korean 2.** (4:5:0) Prerequisite: Korea 201 or equivalent.
Continuation of Korea 201. Conversation, basic reading and writing skills, culture. Introduction to Chinese characters. Not for returned missionaries.
- 211R. Second-Year Conversation.** (2:2:0 ea.) Prerequisite: Korea 201 or foreign residence experience.
Intermediate listening comprehension and speaking skills.
- 301. Third-Year Korean 1.** (4:5:0) Prerequisite: Korea 202 or equivalent.
Vocabulary, grammar, discourse, pronunciation, hanja, and culture. First course for returned missionaries.
- 302. Third-Year Korean 2.** (4:5:0) W Prerequisite: Korea 301 or equivalent.
Continuation of Korea 301. Vocabulary, grammar, discourse, hanja, composition, pronunciation, and culture.
- 311R. Third-Year Conversation.** (2:2:0 ea.) W Prerequisite: Korea 301 or foreign residence experience.
Advanced conversational skills.
- 321. Selected Readings of Modern Korean.** (3:3:0) Prerequisite: Korea 301 or equivalent.
Mixed script (with hanja) and other readings from modern documentary and literary texts, emphasizing comprehension, grammar, and vocabulary building.
- 325. Structure of Korean.** (3:3:0) Prerequisite: Korea 302.
Applying phonology, morphology, syntax, and semantics to the problems of learning Korean.
- 340. Korean Literature to 1900.** (3:4:0) Prerequisite: Korea 302.
Korean literature from the earliest times to 1900, emphasizing basic literary concepts.
- 344R. Korean Literature in Translation.** (3:3:0 ea.)
All readings in English; topics vary.
- 345. Korean Culture.** (3:3:0)
Selected topics in traditional, modern, and contemporary Korean culture. All readings in English.
- 399R. Academic Internship.** (1–9:0:0 ea.) Prerequisite: Korea 301; instructor's consent.
On-the-job cultural and language experience.
- 401. Fourth-Year Korean 1.** (3:3:0) F Prerequisite: Korea 302.
Advanced language preparation in reading, discourse, writing, and hanja.
- 402. Fourth-Year Korean 2.** (3:3:0) W Prerequisite: Korea 401.
Continuation of Korea 401. Advanced reading, discourse, writing, and hanja.
- 427. Korean Translation and Interpretation.** (3:3:0) Prerequisite: Korea 302.
Learning and applying techniques of translating and interpreting Korean.

441. Classical Korean (Hanmun). (3:4:0) Prerequisite: Korea 321 or Chin 441.

Reading of premodern, documentary Sino-Korean texts, including genealogy records and the Choson Dynasty Annals.

443. Korean Literature after 1900. (3:4:0) Prerequisite: Korea 302.

Literary texts from major post-1900 authors, in Korean, emphasizing reading, translating, and criticism.

471. Advanced Readings in Korean Language and Literature. (3:3:0) Prerequisite: Korea 325.

Readings in current linguistic journals and contemporary literature and criticism.

490R. Individual Study in Korean. (1–3:Arr.:0 ea.) Prerequisite: instructor's consent.

Individual assignments appropriate to needs of advanced students.

495. Senior Seminar. (2:2:0)

Individual research, with seminar paper the primary objective. Required for Korean majors.

Near Eastern Languages**Near Eastern Languages (Ne Lg)****Undergraduate Courses**

321R. Studies in Modern Near Eastern Languages. (4:4:2 ea.)

Grammar, reading, writing, and conversational skills.

340. Ancient Near Eastern Mythology. (3:3:0)

Major themes in mythological literature of Egypt, Canaan, Mesopotamia, Anatolia, and ancient Iran. All readings in English.

345. Texts and Ancient Temples. (3:3:0)

Major ancient Near Eastern texts dealing with the temple; analysis of primary elements of ancient temple type as a place of worship.

495. Senior Seminar in Near Eastern Studies. (3:3:0) Prerequisite: Near Eastern Studies major; senior status.

Capstone course for Near Eastern Studies majors. Includes major research paper demonstrating ability to integrate cross-disciplinary information and methodology.

511R. Studies in Ancient Near Eastern Languages. (2–4:4:0 ea.)

Grammar and reading skills.

521R. Special Topics in Ancient Near Eastern Literature. (2–3:3:0 ea.)

Historical and comparative studies of ancient Near Eastern literature.

Asian and Near Eastern Languages Faculty**Professors**

Gessel, Van C. (1990) BA, U. of Utah, 1973; MA, PhD, Columbia U., 1975, 1979.

Honey, David B. (1987) BA, U. of California, Los Angeles, 1980; MA, PhD, U. of California, Berkeley, 1984, 1988.

Miller, J. Scott (1994) BA, Brigham Young U., 1982; MA, PhD, Princeton U., 1986, 1988.

Parkinson, Dilworth B. (1980) BA, Brigham Young U., 1975; MA, PhD, U. of Michigan, 1976, 1982.

Parry, Donald W. (1992) BA, MA, Brigham Young U., 1985, 1986; PhD, U. of Utah, 1992.

Peterson, Daniel C. (1986) BA, Brigham Young U., 1977; PhD, U. of California, Los Angeles, 1990.

Ricks, Stephen David (1981) BA, MA, Brigham Young U., 1974, 1976; PhD, U. of California, Berkeley, and Graduate Theological Union, 1982.

Watabe, Masakazu (1977) BA, MA, Brigham Young U., 1972, 1973; PhD, U. of Southern California, 1978.

Biology

Associate Professors

Belnap, R. Kirk (1990) BA, MA, Brigham Young U., 1983, 1986; PhD, U. of Pennsylvania, 1991.
Bourgerie, Dana S. (1991) BA, U. of Minnesota, 1982; MA, PhD, Ohio State U., 1987, 1990.
Christensen, Matthew B. (1995) BA, Brigham Young U., 1988; MA, PhD, Ohio State U., 1990, 1994.
Peterson, Mark A. (1983) BA, Brigham Young U., 1971; MA, PhD, Harvard U., 1973, 1987.
Russell, Robert A. (1982) BA, U. of Utah, 1968; PhD, Harvard U., 1977.
Toronto, James A. (1992) BA, MEd, Brigham Young U., 1975, 1980; MA, PhD, Harvard U., 1984, 1992.
Warnick, J. Paul (1996) BS, MA, Brigham Young U., 1983, 1989; PhD, Ohio State U., 1996.

Assistant Professors

Damron, Julie Ann (2005) BA, Brigham Young U., 1991; MAT, School for International Training, 1993; PhD, Purdue U., 2000.
Riep, Steven L. (2003) BA, U. of California, Berkeley, 1987; MA, PhD, U. of California, Los Angeles, 1991, 2001.
Stoneman, Jack (2005) BA, Brigham Young U., 1998; MA, PhD, Columbia U., 2002, 2006.

Instructor

Richards, Monica H. (2001) BA, Brigham Young U., 1995; MA, U. of Utah, 2001.

Emeriti

Beaman, Bruce W. (1970) BA, Brigham Young U., 1959; MA, Indiana U., Bloomington, 1969.
Lee, Tsai-feng (Mazie) (1965) BA, MA, U. of Hawaii, 1960, 1972.
Pack, Melvin Deloy (1974) BS, U. of California, Los Angeles, 1965; MA, Brigham Young U., 1973; PhD, U. of Pennsylvania, 1981.
Perkins, George W. (1975) BA, Brigham Young U., 1962; MA, PhD, Stanford U., 1967, 1977.
Williams, Gary S. (1966) BA, Brigham Young U., 1962; PhD, U. of Washington, 1973.

Asian Studies

See International and Area Studies section of this catalog.

Astronomy

See Physics and Astronomy section of this catalog.

Aymara

See Center for Language Studies.

Basque

See Center for Language Studies.

Bicolano

See Center for Language Studies.

Biochemistry

See Chemistry and Biochemistry section of this catalog.

Biology

Biology Office
Shauna C. Anderson, Director
375 WIDB, (801) 422-4294

College of Biology and Agriculture Advisement Center
380 WIDB, (801) 422-3042

Admission to Degree Program

The degree program in biology has open enrollment.

The Discipline

A degree for students who desire a broad approach to biology, the major provides solid preparation for graduate schools in most fields of biology as well as for a full range of professional schools.

Career Opportunities

The biology major is designed to help students do the following: improve writing, use problem-solving skills to arrive at a possible diagnosis of a pathologic state, analyze and interpret experimental data, apply a mathematical paradigm to a biological concept, create conceptual models, learn to suspend judgment, critically read scientific literature, evaluate ability of an argument or evidence to support a conclusion, formulate questions and design experiments to answer them empirically, practice quantitative reasoning, distinguish cause from correlation, teach, judge biological concepts in a historical context, and identify similarities and differences.

The skills acquired in the biology major will be valuable to those students desiring to enter a variety of graduate programs or professional schools.

Graduation Requirements

To receive a BYU bachelor's degree a student must complete, in addition to all requirements for a specific major, the following university requirements:

- The university core, consisting of requirements in general and religious education (See the University Core section of this catalog for details. For a complete listing of courses that meet university core requirements, see the current class schedule.)
- A minimum of 30 credit hours in residence
- A minimum of 120 credit hours
- A cumulative GPA of at least 2.0

Undergraduate Program and Degree

BS Biology

Students should see their college advisement center for help or information concerning the undergraduate programs.

BS Biology (57–61 hours*)

Major Requirements

1. Complete the following core requirements:
Biol 120, 220, 240, 241, 340, 350, 360, 420, 421.
2. Complete one course from the following:
InBio 380.
MMBio 351.
PAS 440.
PDBio 305, 362.
3. Complete one course from the following:
Math 112, 119.
Stat 221.

4. Complete one of the following options:
Either Phscs 105, 106, 107, 108.
Or Phscs 121, 123, 220.
5. Complete at least 13 hours from the following:
 Chem 105, 106, 107, 152, 223, 281, 351, 352, 353, 481.
6. Complete at least 12 hours of elective courses. Electives may include upper-division courses, mentored experience, or a combination of the two:
- Upper-division courses:
 - Students may choose electives from any upper-division courses within the college (except Biol 329, 339, 429, 439, or lab classes). Faculty advisors will be available to offer counsel on the choice of courses. In some cases preapproved upper-division courses from outside the college can be used to fill elective hours. For these, prior approval must be obtained from the Biology Office.
 - Students who are admitted to dental, optometry, podiatry, chiropractic, naturopathic, or pharmacy schools after their junior year can transfer credits from the first year of professional school back to BYU to fulfill the biology electives.
 - Mentored experience:

The mentored experience requires from three hours' minimum to six hours' maximum effort per week each semester for 1 hour of credit. The mentoring will ideally take place over the course of the student's final two semesters. Three options exist for obtaining mentored experience (BYU Study Abroad programs are unacceptable substitutes):

 - Mentored research. Students must be accepted to work under a faculty member's direction. They will frequently associate with other researchers working under the mentor's direction. A written paper and oral presentation are required as fulfillment of the mentored experience. Student research often leads to participation in a publication and/or a presentation at a professional meeting.
 - Mentored internship. Students may obtain credit for a previously approved academic internship program in which the appropriate credit hours are assigned for the experience (limit of 6 credit hours toward biology electives). Students may also plan a semester away into their schedule. By interning in the U.S. and being a full-time student through Independent Study, they may keep scholarships and financial aid without attending class or deferring.
 - Senior thesis. The student may obtain credit for the production of a senior thesis, derived primarily from library study that extensively explores relevant questions determined by an approved faculty mentor. The senior thesis option consists of a combination of course work and credit for the senior thesis research. A prospectus for the senior thesis must be approved by the Biology Office prior to assigning the number of credit hours that apply to the thesis. The final thesis must be submitted and approved before credit will be accepted for the mentored experience.
7. Complete an exit interview.

Recommended Courses

The following courses are recommended for students interested in graduate and professional programs:
 Chem 351, 352, 353, 481.
 Math 119 or higher.
 Phscs 105, 106, 107, 108

*Hours include courses that may fulfill university core requirements.

Biology Composite Teaching

See the Department of Integrative Biology for this degree program.

Preveterinary Medicine

Beverly L. Roeder, Advisor
 386 WIDB (801) 422-6873

Students interested in applying to veterinary medicine schools should take the following courses as part of the biology major:

Biol 291R, 392R (2 hours).
 Chem 351, 352, 353 (1 hour), 481, 482.
 Engl 316.
 InBio 270.
 Math 119 or higher.
 MMBio 221, 222.
 NDFS 330.
 PDBio 484.
 Stat 221.
 TMA 150.

Biology Courses (Biol)

- 100. Principles of Biology.** (3:3:1) F, W, Sp, Su Honors also.
 Introductory course for general education students.
- 120. Science of Biology.** (2:2:1) F, W, Sp Honors also.
 History of science; nature, tools, and results of experimental inquiry.
- 139. Freshman Premedical Seminar.** (0.5:0.5:0) F, W
 Introduction to BYU premedical program.
- 150. Environmental Biology.** (3:3:0) F, W
 Conservation and management of natural resources concurrent with increasing socioeconomic and human population demands; factors such as soil, water, and air pollution, resources management, bioremediation, nutrient cycles, and global climate changes.
- 190R. College of Biology and Agriculture Student Council.** (1:1:0 ea.) F, W, Sp, Su Prerequisite: application for student council position.
 Active involvement on the student council for the College of Biology and Agriculture. Exploring and suggesting solutions to issues facing students in the college.
- 220. Biodiversity.** (2:2:0) F, W, Sp
 Diversity of life on earth: its origins, global distribution patterns, services and values to humankind, and the challenge of protecting it.
- 227. Preview into Optometry.** (1:Arr:0) F, W For sophomores and juniors.
 Advantages and disadvantages of the optometric profession. Applying to and preparing for optometry school.
- 229. Preview into Dentistry.** (1:Arr:0) F, W For freshmen and sophomores.
 Advantages and disadvantages of the dental profession. Application to and preparation for dental school.
- 240. Molecular Biology.** (3:3:1) F, W, Sp Prerequisite: Biol 120, Chem 105.
 Fundamentals of protein and nucleic acid structure and their function in the context of the classical experiments that have informed our current models of biology at the molecular level.
- 241. Molecular and Cellular Biology Laboratory.** (1:0:3) F, W, Sp Prerequisite: Biol 240 or concurrent enrollment.
 Molecular and cellular biology techniques laboratory.
- 276. Genetics and Reproduction.** (3:3:0) Independent Study also.
 Prerequisite: any biology course.
 Principles of inheritance.
- 291R. Veterinary Medicine Seminar.** (0.5:1:0 ea.) F
 Preview into veterinary medicine as a profession. Application procedure and preparation for veterinary school.
- 329. Dental School Preparation.** (2:1:1) F, W Prerequisite: Biol 229.
 Practical experience in the areas of dental anatomy, terminology, teeth carving, and dental operatory techniques.

Biology

- 339. Preview into Medicine.** (2:2:0) F, W For sophomore, junior, and transfer students.
Medical education (admission procedures, curriculum), medical specialties in practice, ethics, legal and governmental concerns, health care delivery systems, and related professions.
- 340. Genetics.** (2:2:1) F, W, Su Prerequisite: Biol 240.
Genetic mechanisms, their fundamental nature, interactions, and applications to human affairs. Genetics in quantitative terms. Extensive practice in problem solving.
- 350. Ecology.** (3:3:0) F, W, Sp Prerequisite: Biol 120, 220.
Distribution and abundance of organisms and their interactions with the physical and biotic components of the earth.
- 360. Cell Biology.** (3:3:1) F, W, Su Prerequisite: Biol 240.
Fundamentals of cell structure and function with reference to analytical methods used by cell biologists. Practice in designing, executing, and interpreting relevant experiments.
- 392R. Preveterinary Preceptorship.** (1–2:0:Arr. ea.) F, W, Sp, Su
Supervised on-the-job exposure to veterinary medicine under a clinical setting, supplemented with academic assignments.
- 399R. Academic Internship.** (1–6:0:Arr. ea.) F, W, Sp, Su
Prerequisite: mentor's consent.
Approved experiential learning.
- 420. Evolutionary Biology.** (2:2:0) F, W, Sp Prerequisite: Biol 240, 340.
Intensive examination of evolution as the conceptual cornerstone of biology.
- 421. Evolutionary Biology Laboratory.** (1:0:3) F, W, Sp
Prerequisite: Biol 240, 340; Biol 420 or concurrent enrollment.
Methodology and evidence used in evolutionary biology: comparative anatomy, DNA and protein techniques, radiometric and non-radiometric dating, fossil data, etc.
- 429. Clinical Observation for Predental Students.** (2:1:3) F, W, Sp
Prerequisite: Biol 329.
Experience in local dental offices for junior and senior pre dental students.
- 439. Clinical Observation for Premedical Students.** (2:1:3) F, W
Prerequisite: Biol 339; junior or senior standing and instructor's consent.
Observing with practicing physician and in hospitals.
- 489R. Senior Library Thesis.** (1–6:0:Arr. ea.) F, W, Sp, Su
Prerequisite: prospectus approval by Biology Office.
Mentored library study that extensively explores relevant questions determined by an approved faculty mentor.
- 490R. Special Problems.** (1–6:0:Arr. ea.) F, W, Sp, Su Prerequisite: Biology Office consent.
- 494R. Mentored Research.** (1–6:0:Arr. ea.) F, W, Sp, Su
Prerequisite: mentor's consent.
- 499R. Senior Honors Thesis.** (1–6:0:Arr. ea.) F, W, Sp, Su
Prerequisite: mentor's consent.
Topic to be cleared with Honors Program and Biology Office.

500-Level Graduate Courses (available to advanced undergraduates)

- 503. Research Orientation.** (1:1:0) F
Introduction to graduate school and research techniques.

Botany and Range Science

See Integrative Biology and Plant and Animal Sciences sections of this catalog.

Bulgarian

See Germanic and Slavic Languages.

Burmese

See Center for Language Studies.

Business

See Marriott School of Management.

Cakchiquel

See Center for Language Studies.

Cambodian

See Center for Language Studies.

Cantonese

See Asian and Near Eastern Languages.

Catalan

See Center for Language Studies.

Cebuano

See Center for Language Studies.

Chemical Engineering

W. Vincent Wilding, Chair
350 CB, (801) 422-2393

Ira A. Fulton College of Engineering and Technology Advisement
Center
264 CB, (801) 422-4325

Admission to Degree Program

The chemical engineering degree program is open to all students.

The Discipline

Chemical engineering deals with the development and application of manufacturing processes in which chemical and physical changes of materials are involved. Chemical engineers research and develop new methods to manage energy resources as well as commercial consumer products. They design reliable, cost-effective manufacturing plants and implement air-quality control systems. As problem solvers, chemical engineers work on the leading edge of technology—researching and developing the ideas of today for the designs, systems, and products of tomorrow.

Areas of instruction include heat transfer, fluid dynamics, chemical reaction kinetics, thermodynamics, separation operations, materials science, process control, and plant design. In addition, chemical engineering places strong emphasis on computer skills.

The BS curriculum is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET) and the American Institute of Chemical Engineers.

Educational Objectives

The Chemical Engineering Department's educational objectives are to:

1. Graduate students who are prepared for and committed to lives of faith in Jesus Christ; service to family, church, and community; and lives of learning.
2. Graduate students who have a broad university education and who have developed reasoning skills, effective communication abilities, and an understanding of their role in society and of contemporary issues.
3. Provide an education built on a strong foundation of the fundamentals of engineering, science, and mathematics and an excellent preparation in chemical engineering theory and practice.
4. Graduate students who exemplify professional ethics, have an appreciation for diversity and an ability to work with and contribute to the development of others, and are committed to responsible engineering practice.

These objectives are intended to help develop the following attributes in students graduating from the program:

1. An understanding of the chemical engineering major and profession.
2. An understanding of fundamental principles of mathematics and science.
3. An understanding of chemical engineering fundamentals.
4. Practical experience with chemical process equipment, chemical handling, chemical analysis, and process instrumentation.
5. An ability to use modern engineering tools necessary for engineering practice.
6. An ability to define and solve engineering problems.
7. A dedication to and a working knowledge of safety and environmental aspects of engineering practice.
8. An ability to communicate ideas effectively in both oral and written form.

9. An ability to work effectively with others to accomplish common goals.
10. An ability to apply chemical engineering fundamentals to solve open-ended problems and to design process units and systems of process units including multiple operations.
11. An appreciation for and a commitment to ethical and professional responsibilities.
12. An appreciation for and a commitment to the continuing pursuit of excellence and the full realization of human potential.

Career Opportunities

The combination of knowledge about process engineering, math, and chemistry obtained in the chemical engineering curriculum is a versatile preparation that opens a wide variety of opportunities to graduates. This versatility is one reason why chemical engineers have traditionally been among the highest paid professionals in the engineering and science disciplines.

Chemical engineers make a significant difference in the quality of life. Some develop clean, new energy sources to power society. Some develop and produce fertilizers and other agricultural chemicals to feed mankind. Virtually all pharmaceuticals are produced by chemical engineers to enhance the life of millions. Others study and produce biomedical devices and artificial organs. Still others are involved in development and production of new materials for use in new high-tech products.

Chemical engineers produce chemicals ranging in use from cleaning products to medicines and from man-made fibers for clothing and textiles to plastics for construction and consumer goods. Another large employer of chemical engineers is the semiconductor industry. In work that involves significant knowledge of chemistry and related processes, chemical engineers assist in the design and manufacture of semiconductor chips and circuit boards. The petroleum industry also employs chemical engineers, requiring their expertise for the discovery, production, and refining of petro-chemicals, including fuels, chemicals, and oils.

Many chemical engineers are employed in environmentally related positions, working on ways to improve air and water quality, to reduce acid rain and smog, and to recycle and reduce waste. Additionally, chemical engineers are employed by universities as teachers and researchers and by government agencies to provide answers for energy, environmental, and defense concerns. Chemical engineers also train to work in the medical, business, and legal professions.

Though chemical engineering career opportunities are diverse, job functions can be categorized more easily. Chemical engineers are usually involved in research, design, development, production, technical sales, or management.

In research, they develop new ideas, new products, and new ways to produce existing products more economically and with less environmental impact.

In design, they create the processes that convert raw materials into finished products with emphasis on efficiency, safety, consumer needs, and environmental protection.

The development engineer improves existing processes and technology to better meet changing needs.

Production engineering involves supervision, quality control, and testing of production processes and operations.

Management and technical sales involve decision making with regard to consumer needs and technical capabilities.

Chemical engineers are creative problem solvers. Their careers are rewarding not only from an intellectual and financial view, but also from a personal perspective. Affecting the lives of millions, their solutions provide a better lifestyle for mankind.

Graduation Requirements

To receive a BYU bachelor's degree a student must complete, in addition to all requirements for a specific major, the following university requirements:

- The university core, consisting of requirements in general and religious education (See the University Core section of this

Chemical Engineering

catalog for details. For a complete listing of courses that meet university core requirements, see the current class schedule.)

- A minimum of 30 credit hours in residence
- A minimum of 120 credit hours
- A cumulative GPA of at least 2.0

Undergraduate Programs and Degrees

BS Chemical Engineering

Students should see their college advisement center for help or information concerning the undergraduate programs.

Graduate Programs and Degrees

MS Chemical Engineering

PhD Chemical Engineering

For more information see the BYU 2006–2007 Graduate Catalog.

General Information

The Chemical Engineering Department offers a professional program leading to the bachelor of science degree. The first two years of this program are considered to be preprofessional with course work emphasis on math, chemistry, and chemical engineering fundamentals. The remaining two years are considered to constitute the professional program.

Any student who is admitted to the university may choose this program as a possible major. All students are urged to declare their intention to major in the department upon first entry to the university or as soon thereafter as possible by contacting the college advisement center (264 CB). Students electing to major in this program must successfully complete the minimum preprofessional program requirements and submit an application for the department's professional program.

Transfer Students. Provisions have been made so that a qualified student transferring from a junior college or from another university, college, or department, who has completed the equivalent of the first two years of the academic program, can complete the BS degree requirements in another two years. Contact the department at the earliest date possible so that any variations can be accommodated with minimum loss of time.

Integrated Master's Program. At the end of the sophomore year or during the junior year, a student who desires to obtain a master's degree in chemical engineering may elect to enter the integrated master's program. The purpose of this program is to afford greater flexibility in scheduling course work than is normally available through the traditional BS degree followed by MS degree program. In this program students may work toward both the bachelor's and master's degrees simultaneously, either receiving the BS degree before or at the same time as the MS degree. At the end of the sophomore year students must have a cumulative GPA of 3.5 or more. All credit to be counted toward the master's degree must carry a cumulative GPA of 3.0 or better.

Before completing the final 30 hours of undergraduate course work, students should submit a formal application for admission to the Office of Graduate Studies. Additional details may be obtained from the college advisement center.

Professional Registration. The Chemical Engineering Department encourages graduates to become registered professional engineers. General qualifications for becoming registered are explained in the Ira A. Fulton College of Engineering and Technology section of this catalog. Some states require this status for consulting and practice in the private sector. Successful completion of the basic chemical engineering program outline prepares graduates to pass the Fundamentals of Engineering (FE) examination. Students who wish to become registered as professional engineers are also advised to talk to their advisor about developing their own professional engineering option, which may include additional FE preparation courses.

Professional Program Admission Policy. Admission to the professional program is available to all students in good academic

standing with the university who have (a) passed the prerequisite courses for the first-semester professional courses, namely Ch En 273 and Math 302, and (b) submitted to the department an Application for the Chemical Engineering Professional Program.

The Application for the Chemical Engineering Professional Program requires students to meet with their department advisor for direction and counseling with regard to performance in the preprofessional program courses and successful completion of the professional program.

Academic Standards and Continuance Policy. The student's academic standing with the university must be "Good" or "Previous" to enroll in professional program courses. Anyone who accumulates chemical engineering grades below C– in excess of 6 hours may not take further chemical engineering courses until he or she has reduced the unacceptable credits to 6 hours or less. A student may not graduate with more than 3 hours below C– in chemical engineering courses.

BS Chemical Engineering (101.5–103.5 hours*)

Major Requirements

1. Students are strongly encouraged to consult with the department about their course scheduling.
2. Complete the following preprofessional courses:
Chem 111, 112 (or 105, 106, 107).
Ch En 170, 263, 273, 291.
Math 112, 113, 302, 303.
Phscs 121, 220.
3. Complete the following professional courses:
Ch En 311, 373, 374, 376, 378, 391, 436, 451, 475, 476, 477, 478.
4. Complete the following supporting courses:
Biol 100.
Chem 351, 352, 461.
Engl 316.
Stat 361.
And complete one course from the following:
Econ 110.
Eng T 200.
5. Complete technical electives (12 hours minimum) satisfying the following requirements:
 - a. Complete 2 hours of chemistry laboratory (Chem 213, 353, 464, or 465).
 - b. Complete 6 hours of advanced (300-level or above) engineering course work from any of the following departments: Chemical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, Mechanical Engineering, or the School of Technology.
 - c. Complete 4 hours of advanced (300-level or above) course work from an engineering, math, science, or business department. Only 1 hour of Chem 497 is acceptable. No more than 2 hours of Ch En 498R (only 1 hour if Chem 497R is taken) may be applied to the program. Phscs 281 is approved for this requirement.
6. Pass a basic competency exam (L3 exam) administered by the Chemical Engineering Department (see the department for details).

*Hours include courses that may fulfill university core requirements.

Chemical Engineering (Ch En)

Undergraduate Courses

170. Introduction to Chemical Engineering. (2:2:0) F, W
Principles of chemical processes and analyses with spreadsheets and graphics. Applying chemical engineering to current problems.

199R. Academic Internship. (1–3:Arr.:Arr. ea.) F, W, Sp, Su
Prerequisite: consent of both department chair and cooperative education coordinator.

Work experience evaluated by supervisor and posted on student's transcript.

263. Computational Tools for Chemical Engineers. (2:2:0) F, Sp
Prerequisite: Ch En 170 or concurrent enrollment; Math 113.

Use of spreadsheets, advanced equation-solving packages, and structured languages to solve engineering problems. Introduction to chemical process principles. College Lecture attendance required.

273. Chemical Process Principles. (3:3:0) W, Sp Prerequisite: Ch En 170 or equivalent or concurrent enrollment; Ch En 263 or equivalent; Chem 106 or 112; concurrent enrollment in Phcs 121, Math 113.

Material and energy balances. College Lecture attendance required.

291. Preprofessional Seminar. (0.5:1:0) F, W

Presentations by faculty, advisors, and industrial representatives. College Lecture attendance required.

310. Energy and the Environment. (3:3:0) F Prerequisite: Ch En 273 or equivalent.

Energy sources, demands, and processes; costs and environmental studies; case studies of various fossil fuel and alternate energy sources; introduction to combustion and flames.

311. Chemical Engineering and Society. (3:3:0) F Prerequisite: Ch En 273; admission to professional program.

Responsibility of chemical engineers when interacting with society relative to safety, environment, and ethics.

373. Chemical Engineering Thermodynamics. (3:3:0) W
Prerequisite: Ch En 273, 311; Chem 461.

First and second laws of thermodynamics as applied to behavior of real fluids; physical and chemical equilibrium. College Lecture attendance required.

374. Fluid Mechanics. (3:3:0) F Prerequisite: Math 302, Ch En 273; concurrent enrollment in Ch En 311; admission to professional program.

Basic mass, momentum, and energy relations of fluid flow; design of fluid-handling systems and equipment. College Lecture attendance required.

376. Heat and Mass Transfer. (3:3:0) W Prerequisite: Ch En 311, 374.

Heat and mass transfer, including conduction, convection, radiation, diffusion; steady and unsteady state systems; transport analogies; design applications.

378. Science of Engineering Materials. (3:3:0) F, Sp Prerequisite: Chem 351 or instructor's consent.

Fundamental principles of solid materials and their properties and behavior in engineering applications of metals, polymers, ceramics, and glasses.

381. Introduction to Semiconductor Processing. (3:2:1) F
Prerequisite: Chem 105 or 111 or equivalent; Math 303 or equivalent; Ch En 273 or instructor's consent.

Unit operations related to silicon-based semiconductor processing, including substrate preparation, photolithography, doping, etching, and thin film formation. Lab included.

391. Career Skills. (1:1:0) F, W Prerequisite: admission to professional program.

Professional, communication, and lifelong learning skills. Field trip to chemical process facility.

400. Creative Skills in Chemical Engineering. (1:1:0) F

Application of creativity and technical knowledge from prior course work to solution of relevant, open-ended problems.

411. Air Pollution Control. (3:3:0) W alt yr. Prerequisite: Ch En 273 or instructor's consent.

Causes and effects of air pollution; standards, criteria, and legislation; dispersion, meteorology, and atmospheric chemistry. Includes design project and use of impact statements.

412. Introductory Nuclear Engineering. (3:3:0) On dem.
Prerequisite: Math 303; Chem 106 or 112.

Principles and application of nuclear reactor design.

436. Process Control and Dynamics. (3:3:0) F Prerequisite: Math 303, Ch En 376, 478.

Process systems, associated control systems, and instrumentation. Use of Laplace transforms and complex variables.

451. Chemical Engineering Plant Design and Process Synthesis. (4:4:0) W Prerequisite: Ch En 391, 436, 476, 478.

Design of chemical engineering machinery; plants and/or processes requiring application of unit operations; chemical process principles; economic analysis. Synthesis and optimization of chemical processes. College Lecture attendance required.

475. Unit Operations Laboratory 1. (2:1:6) F, Sp Prerequisite: Ch En 374, 376, 391; Engl 316; Stat 361.

Experimental verification of unit operations design principles; data collection and reduction; report preparation.

476. Separations. (3:3:0) F Prerequisite: Ch En 373, 376.

Stage operations, distillation, extraction, and absorption; design applications. College Lecture attendance required.

477. Unit Operations Laboratory 2. (2:1:6) W, Sp Prerequisite: Ch En 476, 478. Recommended: Ch En 391, 476, 478; Engl 316; Stat 361.

Experimental verification of unit operations design principles; data collection and reduction; report preparation.

478. Chemical Reaction Engineering. (3:3:0) W Prerequisite: Ch En 311, Chem 461.

Fundamental principles and equations of chemical kinetics and reactor design.

493R. Special Topics—Undergraduate. (1–3:3:Arr. ea.)
Prerequisite: instructor's consent.

Classroom study based on student and faculty interest.

498R. Undergraduate Research. (1–3:Arr.:Arr. ea.) F, W, Sp, Su
Prerequisite: faculty committee approval.

Final report required; 2 hours maximum allowed for degree credit.

500-Level Graduate Courses (available to advanced undergraduates)

518. Biomedical Engineering Principles. (3:3:0) W Prerequisite: Ch En 374, 376, 478; or equivalents.

Application of chemical engineering principles to model physiologic systems and to solve medical problems.

528. Industrial Catalytic Processes. (2:2:0) Sp alt yr. on dem.
Prerequisite: Chem 106 or 111; 351; Ch En 378, 478; or equivalents.

Fundamentals of catalytic chemistry and materials; applications to important industrial catalytic processes. Includes catalyst materials and preparation, catalyst characterization, fixed-bed reactor design, and catalyst deactivation.

531. Thermodynamics of Multicomponent Systems. (3:3:0) F
Prerequisite: Ch En 373 or Chem 461.

Fundamental concepts and applications in first and second laws, equilibrium and stability, phase equilibrium, and homogeneous and heterogeneous chemical equilibrium.

533. Transport Phenomena. (3:3:0) F Prerequisite: Ch En 476 or concurrent enrollment. Recommended: Math 347.

Transport mechanisms and coefficients and fundamental field equations for momentum, heat, and mass transport, with application to system design.

535. Kinetics and Catalysis. (3:3:0) F Prerequisite: Ch En 478.

Theories and principles of chemical kinetics, including heterogeneous catalysis and reactor design.

541. Computer Design Methods. (3:3:0) Alt. yr. Prerequisite: Math 311, Ch En 376; or equivalents.

Computer-aided design and numerical methods of chemical engineering processes.

578. Polymer Science and Engineering. (3:3:0) W even yr., Sp odd yr. Prerequisite: Ch En 373, 374, 378, 478; or equivalents.

Foundation science and theory of polymer chemistry and physics and their implications in engineering applications. Topics include polymerization chemistry, structure-property relationships, polymer physics, and transport properties.

593R. Special Topics—Intermediate. (1–3:Arr.:Arr. ea.) On dem. Prerequisite: instructor's consent.

Special topics for advanced undergraduate students and for graduate students.

Graduate Courses

For 600- and 700-level courses, see the BYU 2006–2007 Graduate Catalog.

Chemical Engineering Faculty

Professors

Bartholomew, Calvin H. (1973) BES, Brigham Young U., 1968; MS, PhD, Stanford U., 1970, 1972.

Baxter, Larry L. (2000) BS, PhD, Brigham Young U., 1983, 1989.

Fletcher, Thomas H. (1991) BS, MS, PhD, Brigham Young U., 1979, 1980, 1983.

Harb, John N. (1988) BS, Brigham Young U., 1983; PhD, U. of Illinois, 1988.

Lewis, Randy S. (2005) BS, Brigham Young U., 1989; PhD, MIT, 1995.

Oscarson, John L. (1974) BES, Brigham Young U., 1968; MS, PhD, U. of Michigan, 1972, 1985.

Pitt, William G. (1987) BS, Brigham Young U., 1983; PhD, U. of Wisconsin, Madison, 1987.

Rowley, Richard L. (1984) BS, Brigham Young U., 1974; PhD, Michigan State U., 1978.

Solen, Kenneth A. (1976) BS, U. of California, Berkeley, 1968; MS, PhD, U. of Wisconsin, Madison, 1972, 1974.

Terry, Ronald E. (1987) BS, Oregon State U., 1971; PhD, Brigham Young U., 1976.

Wilding, W. Vincent (1994) BS, Brigham Young U., 1981; PhD, Rice U., 1985.

Associate Professor

Hecker, William C. (1982) BS, MS, Brigham Young U., 1974, 1975; PhD, U. of California, Berkeley, 1982.

Assistant Professor

Wheeler, Dean R. (2002) BS, Brigham Young U., 1996; PhD, U. of California, Berkeley, 2002.

Emeriti

Barker, Dee H. (1959) BS, PhD, U. of Utah, 1948, 1951.

Beckstead, Merrill W. (1977) BS, PhD, U. of Utah, 1961, 1965.

Hanks, Richard W. (1963) BES, Yale U., 1957; PhD, U. of Utah, 1960.

Hedman, Paul O. (1977) BS, U. of Utah, 1957; PhD, Brigham Young U., 1973.

Pope, Bill J. (1958) BS, U. of Utah, 1947; MS, PhD, U. of Washington, 1948, 1959.

Smoot, L. Douglas (1967) BS, BES, Brigham Young U., 1957, 1957; MS, PhD, U. of Washington, 1958, 1960.

Chemistry and Biochemistry

Paul B. Farnsworth, Chair
C-104 BNSN, (801) 422-6502

College of Physical and Mathematical Sciences Advisement
Center
N-179 ESC, (801) 422-6270

Admission to Degree Program

All degree programs in the Department of Chemistry and Biochemistry are open enrollment. However, special limitations apply for teaching majors.

The Discipline

Chemistry is the study of matter, the changes undergone by matter, and the laws that govern the changes. Chemists study atoms as well as the structures and reactions of molecules. They also work to develop simplifying models (theories) that permit the correlation and explanation of observations about matter. Chemical principles are fundamental to the understanding of subjects ranging from the molecular basis of biology to the structure of rocks and minerals. Chemistry is an essential foundation in engineering disciplines, especially in chemical engineering, the electronics field, energy and environmental science, geology, pharmacy and medicine, and in virtually all manufacturing areas.

Chemistry is an active science that is vital to human existence. Energy needs, environmental concerns, and requirements for new materials all involve major contributions from chemists. Examples of the diverse areas of interest to chemists include regulation of protein synthesis, signal transduction at the cellular level and proteomics (biochemistry), design and synthesis of medicinal compounds (organic chemistry), design and synthesis of new molecular structures and materials (inorganic chemistry), spectroscopic study of energy transfer and molecular structures (physical chemistry), and analysis of medicinal compounds, biological materials, and contaminants or trace elements found in the environment (analytical chemistry).

Chemistry involves more than test tubes and beakers. It includes working with a variety of equipment and instruments such as mass spectrometers, calorimeters, chromatographs, ultracentrifuges, lasers, X-ray diffractometers, and nuclear magnetic resonance spectrometers.

Career Opportunities

Graduates in chemistry obtain positions in virtually every industry, and those who have imagination and intellectual curiosity are in particular demand. Chemistry is also an excellent preprofessional course of study for those interested in medicine, dentistry, law, and business. The chemistry curriculum is both rigorous and intellectually rewarding.

Graduation Requirements

To receive a BYU bachelor's degree a student must complete, in addition to all requirements for a specific major, the following university requirements:

- The university core, consisting of requirements in general and religious education (See the University Core section of this catalog for details. For a complete listing of courses that meet university core requirements, see the current class schedule.)
- A minimum of 30 credit hours in residence
- A minimum of 120 credit hours
- A cumulative GPA of at least 2.0

Undergraduate Programs and Degrees

BA	Chemistry
BS	Biochemistry
BS	Chemistry
BS	Chemistry Education
Minors	Chemistry
	Chemistry Education

Students should see the department office for help or information concerning the undergraduate programs.

Graduate Programs and Degrees

MS	Chemistry
MS	Biochemistry
PhD	Chemistry
PhD	Biochemistry

For more information see the BYU 2006–2007 Graduate Catalog.

General Information

Required High School Preparation

1. It is recommended that a student complete the following courses in high school:
 - 3 units of English
 - 2 units of physical science, chemistry, and physics.
 - 4 units of mathematics, consisting of 2.5 units of algebra, 1 unit of geometry, and 0.5 unit of trigonometry. This should qualify students to begin college mathematics with Math 112, analytic geometry and calculus.

Because mathematics provides the foundation for all work in the physical and mathematical sciences, particular attention is paid to high school preparation in this subject.

To decide which mathematics course should be taken first, contact the Mathematics Department, 292 TMCB, and request a mathematics placement test.

2. All students, especially freshmen and those transferring, should contact the department between March and August each year for advisement about efficient course scheduling and opportunities for student employment.

Scholarships

Kenneth W. Brighton, Carl J. Christensen, H. Tracy Hall, and Ida Tanner Hamblin scholarships are available to qualified chemistry majors.

BA Chemistry (56.5 hours*)

This degree provides an excellent preparation for those individuals in preprofessional programs (e.g., medicine, dentistry, master of business administration, or law), and it also provides career alternatives in chemistry.

Major Requirements

1. No more than 3 hours of D credit is allowed in major courses.
2. The final 10 hours of required chemistry credit must be taken at BYU.
3. Complete the following:
 - Chem 111, 112, 201, 213, 227, 351M, 352M, 354, 391, 461, 462, 464, 465.
4. Complete the following:
 - Math 112, 113, 302.
 - Phscs 121, 123, 220.
5. After consulting with an advisor, complete 4 hours from the following:
 - Chem 455, 481M, 496R, 497R, 499R, 514, 518, 521, 523, 552, 553, 561, 563, 565, 567, 569, 594R, 596R.

Recommended Courses

Biol 120.
Math 303.

Note: Supporting courses suggested by most medical and dental schools are found in the Preprofessional Advisement section of this catalog. The more rigorous chemistry, mathematics, and physics courses required for the chemistry majors will satisfy the minimum requirements listed there. Elective courses in biochemistry and in biological science are especially pertinent to these preprofessional programs.

*Hours include courses that may fulfill university core requirements.

BS Biochemistry (74.5 hours*)

Students preparing for health-related fields (medicine, dentistry, veterinary medicine) or those who desire an advanced degree (MS, PhD) in biochemistry, biology, or the health sciences receive excellent preparation from this degree program.

Major Requirements

1. No more than 3 hours of D credit is allowed in major courses.
2. The final 10 hours of required chemistry credit must be taken at BYU.
3. Complete the following:
 - Chem 111, 112, 201, 213, 227, 351M, 352M, 354, 391, 462, 468, 481M, 482, 584, 586.
4. Complete 1 hour of the following:
 - Chem 594R (two enrollments).
5. Complete the following:
 - Biol 100**, 340, 360.
 - Math 112, 113.
 - Phscs 121, 123, 220.
 - Stat 221.
6. After consulting with an advisor, complete 4 hours from the following:
 - Chem 455, 489, 496R, 497R, 499R, 514, 518, 521, 523, 552, 553, 561, 563, 565, 567, 569, 581, 583, 596R.

Note: With prior approval, many 400- and 500-level courses in biology, integrative biology, microbiology and molecular biology, and physiology and developmental biology will fill this requirement.

Recommended Courses

Biol 120, 220.
Math 302.

Note: Supporting courses suggested by most medical and dental schools are found in the Preprofessional Advisement section of this catalog. The more rigorous chemistry, mathematics, and physics courses required for the chemistry majors will satisfy the minimum requirements listed there. Elective courses in biochemistry and in biological science are especially pertinent to these preprofessional programs.

*Hours include courses that may fulfill university core requirements.

**See a department advisor for alternatives.

BS Chemistry (74.5 hours*)

This is the preferred degree for chemistry majors (approved by the American Chemical Society) and those who desire an advanced degree (MS, PhD) in chemistry. It also provides excellent preparation for those individuals in preprofessional programs (e.g., medicine, dentistry, business, law).

Chemistry and Biochemistry

Major Requirements

1. No more than 3 hours of D credit is allowed in major courses.
2. The final 10 hours of required chemistry credit must be taken at BYU.
3. Complete the following:
Chem 111, 112, 201, 213, 227, 351M, 352M, 354, 391, 455, 461, 462, 464, 465, 481M, 514, 518, 521, 523.
4. Complete 1 hour of the following:
Chem 594R.
5. Complete the following:
Biol 100**.
Math 112, 113, 302.
Phscs 121, 123, 220.
6. After consulting with an advisor, complete 3 hours from the following:
Chem 482, 496R, 497R, 499R, 552, 553, 561, 563, 565, 567, 569, 584, 586, 596R.

Note: With approval, certain other 300-level and above courses in the allied fields of physics, statistics, engineering, and biology may be taken to satisfy this requirement.

Recommended Courses

Biol 120.
Math 303.
Stat 221.

Note: Elective courses, beyond the requirements above, should be selected in consultation with an advisor. The following should be given consideration: advanced chemistry, foreign languages (especially French, German, Japanese, and Russian), biological sciences, computer science, engineering, mathematics, physics, statistics.

*Hours include courses that may fulfill university core requirements.

**See a department advisor for alternatives.

BS Chemistry Education (79.5 hours*, including licensure hours)

This degree provides preparation for professional high school teaching. High school chemistry teachers will find opportunities available and will know the satisfaction of guiding good students into essential and rewarding careers. Students should work closely with both the Department of Chemistry and Biochemistry and the David O. McKay School of Education Advisement and Certification Office.

Major Requirements

1. No more than 3 hours of D credit is allowed in major courses.
2. The final 10 hours of required chemistry credit must be taken at BYU.
3. Contact the Education Advisement and Certification Office for entrance requirements into the licensure program.
4. A teaching minor is not required for licensure. However, it is strongly recommended.
5. Complete the following:
Chem 111, 112, 201, 213, 227, 351M, 352M, 391, 462.
6. Complete the following:
Math 112, 113.
Phscs 121, 123.
7. Complete 3 hours from the following:
Chem 354, 464, 465, 497R.

8. Complete 10 hours from the following:
Biol 100, 150.
Chem 461, 481M.
Geol 101 or 111.
Math 302, 334, 343.
Phil 423.
Phscs 150 and 220.
9. Complete the Professional Education Component:
 - a. Complete the following:
CPSE 402.
IP&T 286.
Sc Ed 276R, 350, 353, 377R, 378, 379.
Note: Fingerprinting and FBI clearance must be completed before entry into Sc Ed 377R.
 - b. Complete 12 hours from one of the following:
Sc Ed 476R, 496R.

*Hours include courses that may fulfill university core requirements.

Minor Chemistry (17–20 hours*)

Minor Requirements

1. Complete one of the following options:
Either Chem 111, 112, 213
Or Chem 105, 106, 107, 223.
2. Complete one of the following options:
Either Chem 351, 352
And Chem 353 (2 hours) or 354
Or Chem 461, 462, 464, 465.

Note: When all of the chemistry credit required for a minor is transferred from another school, at least one course in chemistry must be taken at BYU with a grade of C or better—or the student may request to take a standardized national exam covering advanced material required for the minor. Chemistry programs at some schools have been evaluated, and their credit is acceptable for the minor. No more than one course with a grade in the D range will be allowed.

*Hours include courses that may fulfill university core requirements.

Minor Chemistry Education (15–18 hours*)

Minor Requirements

1. Complete one of the following options:
Either Chem 111, 112, 213.
Or Chem 105, 106, 107.
2. Complete the following:
Chem 201, 351, 352, 353.
3. Complete one course from the following:
Chem 223, 227, 461, 462, 481.

Note: When all of the chemistry credit required for a minor is transferred from another school, at least one course in chemistry must be taken at BYU with a grade of C or better—or the student may request to take a standardized national exam covering advanced material required for the minor. Chemistry programs at some schools have been evaluated, and their credit is acceptable for the minor. No more than one course with a grade in the D range will be allowed.

*Hours include courses that may fulfill university core requirements.

Chemistry and Biochemistry (Chem)

Undergraduate Courses

100. Elementary College Chemistry. (3:3:0) For nonscience and nonmedical majors. On dem. Independent Study also. Recommended: Phy S 100 or equivalent.

Structure of matter and the chemical consequences of that structure.

101. Introductory General Chemistry. (3:3:0) F, W, Sp, Su Prerequisite: Math 97 or equivalent.

Atomic and molecular structure, periodic relationships, states of matter, chemical reactions and stoichiometry, acids and bases. Primarily for nonscience majors who require a broad introduction to general chemistry.

103. Introductory Chemistry Laboratory. (1:0:3) W Prerequisite: Chem 101 or equivalent.

Introductory laboratory techniques required for simple classical experiments in chemistry.

105. General College Chemistry. (4:5:0) F, W, Sp, Su Prerequisite: Math 110 (or equivalent) or concurrent enrollment.

Atomic and molecular structure including bonding and periodic properties of the elements; reaction energetics, electrochemistry, acids and bases, inorganic and organic chemistry. Primarily for students in engineering and biological sciences. Three lectures and two recitation sections per week.

106. General College Chemistry. (3:4:0) F, W, Su Prerequisite: Chem 105 or equivalent.

Continuation of Chem 105 but covering most of the topics in a more quantitative way. Detailed treatment of thermodynamics and equilibria. Three lectures and one recitation section per week.

107. General College Chemistry Laboratory. (1:0:3) F, W, Sp, Su Prerequisite: Chem 106 or concurrent enrollment.

Chemical properties, chemical reactions, collection and interpretation of data, preparation of reports. Required for most students needing one year of general chemistry.

111. Principles of Chemistry. (3:3:1) F Honors also. Prerequisite: Math 110 (or equivalent) or concurrent enrollment. Strongly recommended: high school chemistry, physics, and introductory calculus or concurrent enrollment in Math 112.

Stoichiometry, kinetic-molecular theory, thermodynamics, states of matter, solutions and equilibria, electrochemistry, structure and bonding, chemical reactions, kinetics. Tutorial included.

112. Principles of Chemistry. (3:3:2) W Prerequisite: Chem 111, or equivalent.

Continuation of Chem 111. Tutorial included.

152. Introductory Organic Chemistry. (2:2:0) F, W, Sp Prerequisite: Chem 101 or adequate high school preparation in chemistry.

Principles of structure and reactivity, properties and reactions of compound classes, syntheses.

201. Chemical Handling and Safe Laboratory Practices. (0.5:1:0) F 1st blk., W 2nd blk., Sp Prerequisite: Chem 213 or 223 or concurrent enrollment.

Safe handling of chemicals and safe practices in chemistry laboratories.

213. Introductory General Chemistry Laboratory. (2:0:6) F, W Prerequisite: Chem 112 or concurrent enrollment (preferred).

Principles and techniques of chemical measurements. Concepts introduced in general chemistry lecture courses reinforced.

223. Quantitative and Qualitative Analysis. (4:2:6) F, Sp Prerequisite: Chem 106 or equivalent.

Principles of chemical equilibrium, quantitative chemical measurements, and qualitative detection of selected chemical species. Primarily for majors in molecular biology and the life sciences.

227. Introductory Analytical Chemistry. (4:2:6) F, Sp Prerequisite: Chem 213.

Principles of quantitative analysis, introductory instrumental methods, and computer applications to chemical analysis.

281. Introductory Biochemistry. (3:3:0) F, W, Su Prerequisite: Chem 152 or equivalent.

Relationships between chemical structure and physiological function, overall correlation of metabolism. Students with more extensive preparation should register for Chem 481.

351. Organic Chemistry. (3:3:1) F, W, Sp Prerequisite: Chem 105, 111, or equivalent.

Chemical bonds and molecular structure, conformation and configuration, functional classes, reactions and mechanisms, syntheses. Primarily for majors in chemistry, chemical engineering, and the biological sciences.

351M. Organic Chemistry—Majors. (3:3:0) F Prerequisite: Chem 105, 111, or equivalent.

Chemical bonds and molecular structure, conformation and configuration, functional classes, reactions and mechanisms, syntheses.

352. Organic Chemistry. (3:3:0) F, W, Sp, Su Prerequisite: Chem 351 or equivalent.

Continuation of Chem 351.

352M. Organic Chemistry—Majors. (3:3:0) W Prerequisite: Chem 351M or equivalent.

Continuation of Chem 351M.

353. Organic Chemistry Laboratory—Nonmajors. (1–2:0:6) F, W, Sp, Su Prerequisite: Chem 352 or concurrent enrollment (preferred). For premedistry, premedicine, and other majors who do not intend to take Chem 455.

Physical and chemical properties, isolation and purification, characterization, syntheses.

354. Organic Chemistry Laboratory—Majors. (2:0:6) F, W, Sp Prerequisite: Chem 352 or concurrent enrollment (preferred).

Physical and chemical properties, manipulative skills, isolation and purification, characterization and identification, syntheses.

355. Organic Chemistry Laboratory 2—Nonmajors. (1:0:3) F, W, Sp, Su Prerequisite: Chem 352, 353; or concurrent enrollments.

Physical and chemical properties, isolation, purification, characterization, identification, and syntheses of organic compounds.

391. Technical Writing Using Chemical Literature. (3:3:0) F, W Prerequisite: Chem 227, 352.

Intensive technical writing course based on chemical literature sources. Fulfills GE Advanced Written and Oral Communication requirement.

455. Synthesis and Qualitative Organic Analysis. (3:1:6) F Prerequisite: Chem 354; 201 or concurrent enrollment. For chemistry and other science majors.

Laboratory course emphasizing isolation, purification, and characterization of major and minor products from selected syntheses.

461. Physical Chemistry. (3:3:0) F, W Prerequisite: Chem 227 or Ch En 263 or equivalent; Phcs 123 or concurrent enrollment. Recommended: Math 302.

Thermodynamics and equilibria, states of matter, kinetic-molecular theory, kinetics. May be taken before or after Chem 462.

462. Physical Chemistry. (3:3:0) F, W Prerequisite: Chem 227 or Ch En 263; Phcs 123 or concurrent enrollment.

Quantum mechanics, group theory, atomic and molecular structure, spectroscopy, computational methods, statistical mechanics. May be taken before or after Chem 461.

Chemistry and Biochemistry

464. Physical Chemistry Laboratory 1. (1:1:Arr.) F, W Prerequisite: Chem 227; 461, or concurrent enrollment.

Experiments related to physical chemistry: thermodynamics and equilibria, phase transitions, kinetic-molecular theory, kinetics; computer manipulation of data, report preparation. May be taken before, after, or concurrent with Chem 465.

465. Physical Chemistry Laboratory 2. (1:1:0) F, W Prerequisite: Chem 227, 462; or concurrent enrollment.

Experiments related to physical chemistry: quantum mechanics, group theory, atomic and molecular structure, spectroscopy, computational methods, statistical mechanics; computer manipulation of data, report preparation. May be taken before, after, or concurrent with Chem 464.

468. Biophysical Chemistry. (3:3:0) W Prerequisite: Chem 462; 481 or concurrent enrollment. For biochemistry (BS) majors and those interested in the health professions or biochemistry.

Applications of physical chemistry to biological systems. Thermodynamics, equilibria, transport properties, kinetics, spectroscopic applications, computational methods, structural biochemistry.

481. Biochemistry 1. (3:3:0) F, W, Sp Prerequisite: Chem 352; Biol 100 or equivalent. For chemistry majors and students in biological sciences who contemplate pursuing advanced degrees, including medicine.

First-semester biochemistry. Molecular components of cells, chemical structure and function, enzymes, metabolic transformations, photosynthesis.

481M. Biochemistry 1—Major. (3:3:0) F Prerequisite: Chem 352; Biol 100 or equivalent. For chemistry and biochemistry majors only.

First-semester biochemistry. Molecular components of cells, chemical structure and function, enzymes, metabolic transformations, photosynthesis.

482. Biochemistry 2. (3:3:0) W, Sp Prerequisite: Chem 481 or equivalent.

Second-semester biochemistry. Nucleic acid biochemistry and molecular biology: nucleotide metabolism, chromosome and chromatin structure, DNA structure and replication, RNA transcription and gene expression, protein synthesis and regulation, eukaryotic gene systems, signal transduction.

489. Structural Biochemistry. (3:3:0) On dem. Prerequisite: Chem 481 or equivalent.

Molecular structures of proteins, RNA and DNA as determinants of biological function. Topics include thermodynamics of folding and binding, structural determination, spectroscopy, modeling, protein recognition.

496R. Academic Internship: Chemistry and Biochemistry.

(1–6:Arr.:Arr. ea.) F, W, Sp, Su Prerequisite: instructor's consent; Chem 201 or concurrent enrollment or special safety training.

Research experience in an industrial, academic, or government laboratory in collaboration with a BYU faculty colleague/supervisor.

497R. Undergraduate Special Problems. (1–6:Arr.:Arr. ea.) F, W, Sp, Su Prerequisite: instructor's consent and Chem 201 or concurrent enrollment or special safety training.

Undergraduate research experience.

499R. Honors Thesis. (1–6:Arr.:Arr. ea.) F, W, Sp, Su Prerequisite: instructor's consent and Chem 201 or concurrent enrollment or special safety training.

500-Level Graduate Courses (available to advanced undergraduates)

501. Safe Chemical Practices. (0.5:0.5:0) W 1st blk.

University and department safety policies. Chemical hazards, fire safety, and biosafety, including laws.

514. Inorganic Chemistry. (3:3:0) F Prerequisite: Chem 451, 462; or 462, 468; or equivalents.

In-depth treatment of theoretical concepts in inorganic chemistry and the descriptive chemistry of some of the elements.

518. Advanced Inorganic Laboratory. (2:0:6) W Prerequisite: Chem 201 or concurrent enrollment; Chem 514.

Syntheses, characterization, and properties of materials; coordination and organometallic compounds.

521. Instrumental Analysis Lecture. (2:2:0) F Prerequisite: Chem 462 or equivalent.

Modern instrumental methods and basic principles of instrumentation.

523. Instrumental Analysis Laboratory. (2:0:6) W Prerequisite: Chem 521; Chem 501 or concurrent enrollment.

Continuation of Chem 521. Laboratory experience with modern analytical instrumentation.

552. Advanced Organic Chemistry. (3:3:0) F Prerequisite: Chem 351, 352; 461 or 468; 462; or equivalents.

Physical aspects of organic chemistry; mechanisms, reaction intermediates, bonding, stereochemical and stereoelectronic effects, molecular orbital theory, Lewis acidity and basicity.

553. Advanced Organic Chemistry. (3:3:0) W Prerequisite: Chem 351, 352; or equivalents.

Synthetic aspects of organic chemistry; oxidations, reductions, concerted reactions, stereoselectivity, synthetic equivalents, protecting groups. Examples of natural product total synthesis.

555. Organic Spectroscopic Identification. (3:3:0) F Prerequisite: Chem 352, 354; or equivalents.

Theory and practice of spectrometric methods of identifying organic compounds, including infrared, ultraviolet, nuclear magnetic resonance, and mass spectrometries.

561. Chemical Thermodynamics. (3:3:0) On dem. Prerequisite: Chem 461, 462; or equivalents.

Development of the principles of chemical thermodynamics, including laws, pure materials, mixtures, equilibria, and elementary statistical mechanics.

563. Reaction Kinetics. (3:3:0) W alt. yr. Prerequisite: Chem 461, 462; or equivalents.

Theoretical aspects of chemical kinetics in the gas phase and in solution. Rates and mechanisms in solution, rapid reactions, and other topics.

565. Introduction to Quantum Chemistry. (3:3:0) F Prerequisite: Chem 461 or 468; 462; or equivalents.

Introduction to physical and mathematical aspects of quantum theory, emphasizing application of the Schrodinger wave equation to chemical systems.

567. Statistical Mechanics. (3:3:0) W alt. yr. Prerequisite: Chem 461, 462; or equivalents. Recommended: Chem 565.

Introduction to classical and quantum statistical mechanics, including Boltzmann, Fermi-Dirac, and Bose-Einstein statistics. Applications of statistical thermodynamics to gases, liquids, and solids.

569. Fundamentals of Spectroscopy. (3:3:0) W alt. yr. Prerequisite: Chem 462 or equivalent.

Atomic and molecular spectroscopy and application of group theoretical concepts. Types of experiments and interpretation of data.

581. Advanced Biochemical Methodology 1. (3:3:0) F Prerequisite: Chem 482 or equivalent.

First of two required courses for biochemistry graduate students. Physical methods used in biochemical research, including centrifugation, structural determinations, and use of radioactivity and spectroscopy.

583. Advanced Biochemical Methodology 2. (3:3:0) W

Prerequisite: Chem 482 or equivalent.

Second of two required courses for biochemistry graduate students. Molecular biological methods used in biochemistry, including immunotechniques, bioinformatics, and selected recombinant DNA techniques.

584. Biochemistry Laboratory/Proteins. (3:1:2) F, W Prerequisite: Chem 481 or equivalent.

Introduction to current biochemical research procedures including spectrophotometry, chromatography, electrophoresis, and immunological techniques. Protein over-expression; isolation and characterization methods. Enzyme kinetics and protein-ligand interactions. Introduction to bioinformatics.

586. Biochemistry Laboratory/Nucleic Acids. (3:1:2) F, W Prerequisite: Chem 482 or equivalent.

Laboratory course covering major techniques involved in isolation, amplification, and cloning of recombinant DNA as well as isolation, synthesis, translation, and identification of RNA.

594R. General Seminar. (0.5:1:0 ea.) F, W

Research topics presented by faculty and visiting scientists. Required every semester in residence of all senior BS majors and graduate students in chemistry and biochemistry.

596R. Special Topics in Chemistry. (1–3:3:0 ea.) On dem.**Graduate Courses**

For 600- and 700-level courses, see the 1990–2007 BYU Graduate Catalog.

Chemistry and Biochemistry Faculty**Professors**

- Andrus, Merritt B. (1997) BS, Brigham Young U., 1986; PhD, U. of Utah, 1991.
 Boerio-Goates, Juliana (1981) BA, Seton Hill Coll., 1975; MS, PhD, U. of Michigan, 1977, 1979.
 Burton, Gregory F. (1997) BS, U. of Utah, 1975; MS, Brigham Young U., 1985; PhD, Virginia Commonwealth U., 1989.
 Dearden, David V. (1994) BS, Brigham Young U., 1983; PhD, California Inst. of Technology, 1989.
 Eatough, Delbert J. (1971) BS, PhD, Brigham Young U., 1964, 1967.
 Farnsworth, Paul B. (1981) BS, Brigham Young U., 1977; PhD, U. of Wisconsin, Madison, 1981.
 Fleming, Steven A. (1985) BS, U. of Utah, 1978; PhD, U. of Wisconsin, Madison, 1984.
 Goates, Steven R. (1981) BS, Brigham Young U., 1976; MS, PhD, U. of Michigan, 1977, 1981.
 Lamb, John D. (1985) BS, PhD, Brigham Young U., 1971, 1978.
 Lee, Milton L. (1976) BA, U. of Utah, 1971; PhD, Indiana U., 1975.
 Nordmeyer, Francis R. (1972) BA, Wabash Coll., 1961; MA, Wesleyan U., 1964; PhD, Stanford U., 1967.
 Owen, Noel L. (1987) BSc, U. of Wales, 1960; PhD, Cambridge U., England, 1964; DSc, U. of Wales, 1983.
 Robins, Morris J. (1986) BA, U. of Utah, 1961; PhD, Arizona State U., 1965.
 Savage, Paul B. (1995) BS, Brigham Young U., 1988; PhD, U. of Wisconsin, 1993.
 Simmons, Daniel L. (1989) BS, MS, Brigham Young U., 1978, 1980; PhD, U. of Wisconsin, Madison, 1986.
 Watt, Gerald D. (1989) BA, PhD, Brigham Young U., 1962, 1966.
 Woolley, Earl M. (1970) BS, PhD, Brigham Young U., 1966, 1969.
 Zimmerman, S. Scott (1978) BS, Brigham Young U., 1969; PhD, Florida State U., 1973.

Associate Professors

- Graves, Steven W. (1998) BA, U. of Utah, 1969; MPhil, PhD, Yale U., 1972, 1978.
 Harrison, Roger G. (1995) BS, Utah State U., 1986; PhD, U. of Utah, 1993.
 Kuchar, Marvin C. J. (1979) AA, Eastern Arizona Coll., 1955; BS, PhD, Brigham Young U., 1957, 1963.

- Peterson, Matt A. (1995) BS, Utah State U., 1987; PhD, U. of Arizona, 1992.
 Shirts, Randall B. (1991) BS, Brigham Young U., 1972; AM, PhD, Harvard U., 1978, 1979.
 Willardson, Barry M. (1996) BA, Brigham Young U., 1984; PhD, Purdue U., 1990.
 Woodfield, Brian F. (1997) BS, MS, Brigham Young U., 1986, 1988; PhD, U. of California, Berkeley, 1995.

Assistant Professors

- Asplund, Matthew C. (2000) BS, Brigham Young U., 1992; PhD, U. of California, Berkeley, 1998.
 Austin, Daniel E. (2005) BS, Brigham Young U., 1998; PhD, California Inst. of Technology, 2002.
 Belnap, David M. (2004) BS, Brigham Young U., 1989; PhD, Purdue U., 1995.
 Buskirk, Allen R. (2004) BS, Brigham Young U., 1999; PhD, Harvard U., 2004.
 Castle, Steven L. (2002) BS, Brigham Young U., 1995; PhD, The Scripps Research Inst., 2000.
 Hansen, Jaron C. (2005) BS, Utah State U., 1997; PhD, Purdue U., 2002.
 Linford, Matthew R. (2000) BS, Brigham Young U., 1990; PhD, Stanford U., 1996.
 Sevy, Eric T. (2001) BS Brigham Young U., 1994; MA, MPhil, PhD, Columbia U., 1995, 1998, 1999.
 Thulin, Craig D. (2002) BA, U. of Utah, 1989; PhD, U. of Washington, 1995.
 Vollmer-Snarr, Heidi R. (2002) BS, U. of Utah, 1997; DPhil, Oxford U., England, 2000.
 Woolley, Adam T. (2000) BS, Brigham Young U., 1992; PhD, U. of California, Berkeley, 1997.

Teaching Professor

- Cannon, John Francis (1970) BS, PhD, Brigham Young U., 1965, 1969.

Associate Teaching Professors

- Hinshaw, Barbara C. (1989) BA, Westminster Coll., 1966; MS, U. of Utah, 1969.
 Wood, Steven G. (2001) BS, MS, PhD, Brigham Young U., 1973, 1975, 1983.

Assistant Teaching Professors

- Brown, Philip R. (1999) BS, PhD, Brigham Young U., 1982, 1986.
 Nielson, Jennifer (2004) BS, Brigham Young U., 1988; MS, PhD, U. of California, San Diego, 1992, 1997.

Assistant Research Professor

- Herron, Steven R. (2004) BS, Brigham Young U., 1992; MS, U. of California, Riverside, 1995; PhD, U. of California, Irvine, 2001.

Emeriti

- Bills, James L. (1963) BS, U. of Utah, 1958; PhD, Massachusetts Inst. of Technology, 1963.
 Blackham, Angus Udell (1952) BA, Brigham Young U., 1949; MA, PhD, U. of Cincinnati, 1950, 1952.
 Bradshaw, Jerald S. (1966) BS, U. of Utah, 1955; PhD, U. of California, Los Angeles, 1963.
 Broadbent, H. Smith (1946) BS, Brigham Young U., 1942; PhD, Iowa State U. of Science and Technology, 1946.
 Butler, Eliot A. (1956) BS, PhD, California Inst. of Technology, 1952, 1956.
 Cluff, Coran L. (1960) BS, Northern Arizona U., 1952; MS, PhD, U. of Michigan, 1955, 1961.
 Dalley, Nelson Kent (1968) BS, MS, Brigham Young U., 1960, 1964; PhD, U. of Texas, Austin, 1968.
 Goates, J. Rex (1947) BS, Brigham Young U., 1942; PhD, U. of Wisconsin, Madison, 1947.
 Gubler, Clark J. (1958) BA, Brigham Young U., 1939; MA, Utah State U., 1941; PhD, U. of California, Berkeley, 1945.
 Hall, H. Tracy (1955) BS, MS, PhD, U. of Utah, 1942, 1943, 1948.
 Hansen, Lee Duane (1972) BS, PhD, Brigham Young U., 1962, 1965.
 Hawkins, Richard T. (1959) BA, Brigham Young U., 1951; PhD, U. of Illinois, 1959.

